

Lund University International Master's Programme in Environmental Science

M.Sc thesis

***Environmental Education,
in an Educational System wherein Academic Subjects
no Longer Exist:
Learning from the Swedish Experience***

by

Alistair K Chadwick

7 Knoll Place
Westville
3630
South Africa

Email: alistair.chadwick.109@student.lu.se

November 1999

Supervisor:

Birgit Hansson:

Department of Education

Lund University

Box 199

221 00 Lund

Phone: 46 46 2223004

birgit.hansson@pedagog.lu.se

TABLE OF CONTENTS

INTRODUCTION	1
1.1 <i>Poverty and Rising Levels of Affluence</i>	1
1.2 <i>The South African Education System</i>	2
1.3 <i>Scope of Research</i>	3
1.4 <i>Objectives and Structure of Study</i>	4
ENVIRONMENTAL EDUCATION, AND THE PROMOTION OF AN HOLISTIC UNDERSTANDING OF THE ENVIRONMENT	6
2.1 <i>Introduction</i>	6
2.2 <i>Academic Subjects and the Fragmentation of Knowledge</i>	6
2.3 <i>The Swedish Education System</i>	7
2.4 <i>An Environmental Education Orientation Within Curriculum 2005</i>	8
2.5 <i>Broadening the view of ‘Environment’ and of Environmental Education</i>	8
2.6 <i>Assessment of the Environmental Education Process</i>	9
EDUCATING CHILDREN FOR THEIR (DEMOCRATIC) PARTICIPATION IN SUSTAINABLE DEVELOPMENT	10
3.1 <i>Introduction</i>	10
3.2 <i>Contextualising Knowledge and Learning</i>	10
3.3 <i>Participation as a Prerequisite for Sustainable Development</i>	11
3.4 <i>Preparing Children for Participation in a Democratic Society</i>	12
3.1 <i>Building Strong Local Democracies through Community-Based Environmental Education</i>	13
RESEARCH METHODS	14
4.1 <i>Introduction</i>	14
4.2 <i>Pilot Study</i>	14
4.3 <i>The Interview Scheme</i>	15
4.4 <i>Interview Participants and Procedure</i>	15
4.0 <i>Data Analysis</i>	15
RESERCH FINDINGS	17
5.1 <i>Introduction</i>	17
5.2 <i>Assessing the Effectiveness of EE within an Integrated Education System</i>	17
5.3 <i>Contextualising Knowledge through Local Activities</i>	19
5.4 <i>Providing Opportunities for Student Participation in a Democratic Society</i>	20
5.1 <i>Teacher Support, and Other Factors, Influencing the Effectiveness of EE</i>	21
DISCUSSION	24
6.1 <i>Introduction</i>	24
6.2 <i>Progressing from a ‘Nature Conservation’ Approach to EE</i>	24
6.3 <i>Promoting Environmentally Responsible Behaviour</i>	25
6.4 <i>Improving the Environmental Knowledge of Teachers</i>	25
6.1 <i>Building upon the Interest and Commitment of Teachers</i>	26
CONCLUSIONS AND RECOMMENDATIONS	27
7.1 <i>Introduction</i>	27
7.2 <i>Recommendations</i>	28
7.1 <i>Concluding Remarks</i>	31
REFERENCES	32
APPENDICES	35

ABSTRACT

South Africa is in the process of transforming school education, adopting an integrated education system, wherein separate, academic subjects no longer exist. This approach is widely believed to be necessary for the achievement of a prosperous, truly united, democratic and sustainable South Africa. It is an approach that is very similar to the one adopted by Sweden, from 1980 onwards.

This work describes and analyses the background and importance of four specific teaching methods or approaches that are common to both of the above countries, and are widely believed to be essential for effective environmental education (EE). These methods include: the use of 'environment' as a cross-curricular theme; the integration of traditional subjects into broad learning areas; the use of group work and other methods which provide pupils with opportunities for participation in decision-making; and the contextualisation of knowledge through the use of local issues as a foundation for school-based EE activities and projects.

A range of findings are then presented, that have resulted from a qualitative study of the experiences of compulsory school teachers in six schools in and around Lund, a small city in southern Sweden. Fifteen (15) teachers were interviewed in order to ascertain how the methods above can best be used for the promotion of effective EE. Foremost amongst the findings is the fact that although the effectiveness of EE is closely linked to the implementation of the above teaching methods, their use is dependant, to a very large extent, upon the environmental interest and motivation of the individual teacher. Such commitment to EE is, in turn, governed by a number of factors and processes, many of which are not in a teacher's hands, and which include:

- the extent to which the school principal, other school leaders, and colleagues have an interest in and support EE;
- the availability of relevant environmental information and examples of EE activities and exercises;
- the availability of in-service education and training (INSET) for teachers, particularly in the field of teacher co-operation and collaboration within school, and in the use of group work and other methods; and
- the availability of time to plan and implement EE activities, cross-curricular or otherwise, with colleagues.

These, and other findings, point to a number of areas for attention within the South African context, and include the perceived critical need for teachers not only to receive education and training, while in service, but also to receive support for their 'environmental work' through a range of mechanisms and structures, that are based on their expressed needs.

Recommendations are then made in the light of the above findings, in the hope that they will facilitate the effective use of the methods, upon which this study has focused. As such, it is clear that the introduction of the above four teaching methods into the South African school curriculum will be a fundamental challenge to the past (traditional), yet dominant conception, organisation and transmission of knowledge, creating for most teachers a conflict with their approach to teaching and learning (Esland, 1971, as cited in Palmer, 1998). This challenge must be taken up. As this paper hopes to make clear, however, there are no blue-prints for success, but the findings seem to indicate that the potential lies in the skills, capabilities, ingenuity and local knowledge of teachers, and in the commitment of the many environmental, and other, non-governmental organisations that exist.

ACKNOWLEDGEMENTS

Throughout this work, a great number of people have been helpful. Foremost amongst these are the teachers and principals from eight schools in, and around, the town of Lund who participated in the study. I am indebted to these individuals for having braved yet another English-speaking researcher and his endless questions. I would also like to express my gratitude to the following persons and institutions:

In South Africa

Dr Jim Taylor, of the Umgeni Valley Project, allowed me to benefit from his experience. His support and guidance, via email, allowed this research to proceed quite rapidly.

In Sweden

Birgit Hansson, my thesis supervisor, has guided and encouraged me throughout the course of this work. Even though she was busy with her PhD research she seemed always to be prepared to read through, and comment upon, my preliminary manuscripts, often at short notice. For her unfailing generosity with her time I am extremely grateful.

I have also received valuable advice from the 'LUMES staff'. Apart from this, both the teaching and non-teaching staff have ensured that I have enjoyed a smooth flowing period of research, as has been the case for the entire duration of the programme.

Finally, I would like to thank STINT, the Swedish Foundation for International Co-operation in Research and Higher Education for funding my stay within Sweden.

Lund, November 1999
Alistair Chadwick

GLOSSARY

Inservice Education and Training (INSET)

All education and training that a teacher undergoes while in the service of an educational institution, e.g. a school, after the completion of the initial period of formal teacher training (at university or teachers training college).

Life Orientation

This is one of eight learning areas. It is central to the holistic development of the learners, caring for their intellectual, physical, personal, social, spiritual and emotional growth, and for the way these facets work together (Senior Phase, 1999).

Mathematical Literacy, Mathematics and Mathematical Science

A learning area which deals with qualitative and quantitative relationships of space and time. It deals with patterns, problem-solving, logical thinking, etc in an attempt to understand the world and make use of that understanding (Senior Phase, 1999).

Outcomes-Based Education (OBE)

A fixed body of knowledge (syllabus) does not exist. Teaching is guided by the progressive development of competence towards the achievement of specific outcomes. To teach towards outcomes, knowledge is more contextualised and is in the service of the outcomes.

Specific outcomes have been derived from the learning areas, e.g. Life Orientation. They specify the skills, knowledge, and values that a learner should possess at the end of a learning experience within each learning area.

Critical outcomes guide all teaching and learning through Grades 1 to 9, as well as the development of learning programmes. Seven critical outcomes have been proposed, all of which should be considered when activities are developed and assessed during the development of learning programmes.

Learning programmes have replaced syllabi, providing guidance for teaching and learning. They are similar to plans of work, which includes guidance on activities, assessment and the application of specific and critical outcomes (Lotz, Tselane and Wagiet, 1998).

Phases

There are three compulsory school phases. The Junior Phase includes grades 1-3, the Intermediate Phase includes grades 4 - 6, while the Senior Phase includes grades 7 - 9.

Phase Organisers

Broad themes or 'phase organisers' as they have been termed, help to organise the content and focus of learning programmes. Six phase organisers have been determined to ensure a balanced programme during a school year or over a phase. "Society" and "environment" are two such phase organisers, helping to 'provide the focus and context for designing teaching and learning processes (activities)' (Lotz et al, 1998) . Application of the phase organiser 'environment' will enable many different environmental education processes in different learning programmes.

Teaching Teams

Teaching teams are often composed of four or five teachers from different disciplines, one of the most important purposes of which "is to find topics in common" for integrated education.

Chapter 1

INTRODUCTION

Environmental education has emerged as a leading approach to solving environmental problems, and creating sustainable societies, in both developed and developing countries. This research project focuses upon environmental education (EE) as practised within the formal education sectors of Sweden and South Africa; countries that have adopted very similar approaches to school education and learning. Within South Africa, an outcomes-based education (OBE)¹ system is, for the first time, in the process of being implemented in schools, as a means of ensuring the sustainable development of the country. This work attempts to assess the Swedish experience and, hence, provide recommendations for South African environmental educators. In essence, it is intended as a support document to assist in the development of learning programmes with an environmental education orientation within, what is termed throughout this paper, an integrated education system.

The standpoint adopted here, is that sustainable development is a path along which to travel, rather than a single goal at which to aim. In order for South Africa to travel along this path it has a number of important environmental and developmental problems to consider, encompassing a mix of 'Third World' environmental problems, such as unemployment, and 'First World' environmental problems, such as wasteful consumption (Ngobese and Cock, 1995). An important step that has already been taken in this direction is the adoption of an 'ecological paradigm' for education, (a term deriving from Emery (1981), as cited in Palmer, 1998). Such a paradigm involves teaching methods that encourage co-operation rather than competition between learners, pupils learning together and from each other, and learning that is reality-centred, preferably taking place outside of the classroom within community settings (Gough, 1987, as cited in Palmer 1998). It is the author's firm belief that a further critical step needs to be taken, which involves learning from the mistakes and successes achieved by other countries with similar approaches to education, in this case Sweden, as they attempt to incorporate environmental and development issues into their school curricula. The following study is an attempt to initiate this process.

1.1 Poverty and Rising Levels of Affluence

At present, poverty is one of the most important environmental-development issues facing South Africa, visible in many urban 'slums', or squatter settlements, and throughout the rural areas. Wherever they may live, poor and poverty-stricken people are generally preoccupied with issues of physical survival. They do not have the money, nor access to relevant skills and knowledge, and hence often little option, but to over-utilise local resources, eventually causing environmental damage. For the majority of these people environmental issues are primarily social issues, and mean unemployment/underemployment, no clean water, poor health, potholed roads, no electricity and no proper sanitation. The struggle against social injustice and poverty must therefore be linked with the struggle for sustainable development. What is required is the empowerment of people, children and adults alike, so that they can control their own resources and therefore their own lives (Jacobsohn, 1991).

¹ See Glossary.

Linked with the above is the threat to environmental sustainability that is, almost paradoxically, posed by the increasingly affluent lifestyles of growing numbers of South Africans. As levels of consumption rise so too, in general, do the rates of resource depletion and the quantities of waste produced. Thus education for sustainable development must be seen as fundamental not only to the residents of underserved communities but to all social classes, with programmes of learning based on the identification of problems and issues by communities and their members.

The above development and environment concerns, have been key concerns in the recent development of South African education and training programmes and curricula. In order to achieve sustainable modes of living, it is the author's belief that such programmes, for people of all ages, 'should engage with political empowerment, social stability, economic development and the sustainability of socio-ecological life support systems' (Janse van Rensburg and O'Donoghue, 1995: 15). In this regard an essential first step has been taken in the restructuring of the national school curriculum.

1.2 The South African School Education System

The South African educational system, in place during the 'apartheid' years, is presently undergoing transformation. Replacing it is 'Curriculum 2005', implemented, in large part, to redress the imbalances that existed in the past system. Under the apartheid government, racial inequalities were responsible for some major educational disadvantages in both rural and urban areas. This was especially so within the rural environment, where children generally lacked access to basic educational tools, such as textbooks, and were very limited by financial constraints and, often, demotivated teachers. In general however, the old curriculum was based on traditional, separate, subjects and had an explicit academic-bias, being data-orientated, rather than problem-solving or skills-orientated. And, sadly, the curriculum perpetuated divisions between races, classes, gender and ethnic groupings, emphasising separateness, rather than common citizenship. A restructuring of this curriculum was, therefore, seen as imperative in order to reflect the values and principles of the new South African society.

The South African White Paper on Education and Training (1995) resulted in the compilation of a curriculum framework document (*Lifelong Learning through a National Curriculum Framework*) which emphasises the need for major changes in education in order to normalise and transform teaching and learning. The result is Curriculum 2005, introduced in Grade 1 in 1998, and which will be introduced in subsequent grades in the following years by the Department of Education. In this new curriculum an emphasis is placed on the necessity for a move from the traditional aims-and-objectives approach to outcomes-based education. This is widely believed to be necessary for the achievement of the following broad outcome for South Africa:

"A prosperous, truly united, democratic and internationally competitive country with literate, creative and critical citizens leading productive self-fulfilled lives in a country free of violence, discrimination and prejudice." (*Lifelong Learning through a National Curriculum Framework*, 1997)

For this vision to become reality it is believed that an environmental orientation to education is essential. This will, in practice, require all South Africans who are involved in education and training to undertake, and become proficient in, 'new' teaching content together with a range of 'new' teaching methods and processes, in order to develop within children the skills, understandings, values, attitudes, and action competencies necessary for sustainable development to be achieved. Such skills and competencies include:

- An holistic understanding of the environment as a system;
- Tolerance and other associated values, necessary for co-operation and democracy; and
- Skills which enable individual and community participation

This research project focuses upon the teaching methods that are believed to facilitate the achievement of these, and which -

- a. have been incorporated within Curriculum 2005; and
- b. were/are aspects of the Swedish educational system, (from 1980 onwards).

1.3 Scope of Research

The focus of this research is upon the experiences and observations of Swedish teachers, during the application of four specific teaching methods or approaches within the Swedish compulsory school education system. These methods, under scrutiny, are integral components of Curriculum 2005. Of critical importance however, is the fact that they are also untried and untested by the majority of South African teachers, and include the following:

1. The use of 'environment' as a cross-curricular theme, to provide a focus for learning activities;
2. The integration of traditional subjects into broad learning areas;
3. The contextualisation of knowledge through the use of local issues as the foundation for learning programmes, and/or the design of school or class projects, based upon the needs of the local community; and
4. The use of group work methods, and the closely associated provision of opportunities for learners to participate in the choice of topics for investigation and methods to be used.

It has been stated that integrated and co-operative learning 'ensures a better level of competency' (www.school.co.za/sage/article5.htm, 1999), ultimately resulting in the improvement of all aspects of our lives. Swedish educators who have been involved in school education during the implementation of such an approach are in a unique position to comment on whether the above is true. Their experiences will provide some indication as to what sort of impact, over time, an integrated education system has upon the sustainability of a student's attitudes, values and actions. Importantly, the methods listed above, are those applied within both Sweden and South Africa, during Grades 7, 8 and 9, during which children are generally between the ages of 11 and 16. They are widely believed to be essential for the building of a peaceful, democratic and environmentally sustainable South African society.

1.4 Objectives and Structure of the study

In broad terms, this study seeks to go some way towards helping to prevent the re-inventing of wheels. Many committed people are sure to spend a great deal of time devising and revising aims, objectives and guidelines for environmental education within Curriculum 2005. The outcomes of these efforts may do little more than replicate the products of similar educational approaches elsewhere in the world. This research project focuses upon the experiences of educators who have worked within the constraints and opportunities of a similar curriculum, in the hope that South African teachers, principals and those involved in curriculum development may direct their energy to refinement, criticism, implementation and development of the ideas presented, rather than to re-invention of appropriate methods and activities. In other words, it is hoped that by recording and assessing the experiences of Swedish teachers this study will provide their South African counterparts with the opportunity

to escape some of the pitfalls and problems they have experienced, and improve upon those methods that were found to be effective.

After undertaking a review of the relevant literature, semi-structured interviews were carried out with a number of Swedish educators. Having analysed the interview responses obtained, this study aims to:

1. set out guidelines for the development of an integrated approach to environmental education, that is most appropriate for Curriculum 2005;
2. identify opportunities that might be expected, within the above approach, for effective environmental education, promoting environmentally sustainable habits and lifestyles;
3. identify pitfalls and problems that might be expected when attempting to carry out environmental education within such an educational approach;
4. identify both what is required and may be possible to support and motivate teachers, many of whom have received their initial teacher training within a traditional subject-based system.

In addition, one further aspect of the environmental ‘theme’ approach to education that this study hopes to qualify is the importance/impact of the teacher’s commitment to environmental education in general and to the educational approach under discussion in particular, upon the environmental attitudes and habits, and general motivation of his/her class. Within the traditional South African approach student motivation often appeared to depend on the personality of the teacher (www.school.co.za/sage/article5.htm, 1999). In contrast, the ‘theme’ approach is believed to encourage the learners to take responsibility for their learning, motivated by constant feedback and affirmation.

The following *chapter* (2) focuses on those ideas and teaching methods, relevant to environmental education, which are based upon the fact that together with an environmental orientation to school education, subjects are approached as integrated areas of learning, rather than independent units of close-ended information.

Chapter 3 starts with a brief review of some of the theoretical work on the contextualisation of knowledge and learning opportunities. Some background information is provided on the concept of sustainable development, while the bulk of the chapter centres around the necessity for the participation of children in the transformation of their communities and local environments. Accordingly, a brief discussion follows on the role that group work, and other ‘classroom’ methods, may play as a means to promote participation in a democratic society.

In *chapter* 4, a brief discussion is provided with regards the method of exploration, in this case semi-structured interviews, carried out with teachers, principals and other educators involved in the implementation of EE within schools.

Chapter 5 presents the findings resulting from the above interviews, and is divided into four parts. In the first part the interview responses referring to the effectiveness of EE within Sweden’s integrated education system are analysed. The second part focuses upon the perceived importance of contextualising knowledge through local activities, while the third part analyses teachers’ experiences of group work and classroom democracy. In the fourth and final part, the need for teacher support from within the school, the surrounding community and local environmental organisations is analysed.

Chapter 6 includes a discussion of the above findings, derived from the analysis of the interview responses.

Chapter 7, finally, summarises the study and presents a range of recommendations. Some concluding remarks show how the results and conclusions of the study link to the presently debated issues of teacher motivation, training and the need for appropriate research topics and methods.

Chapter 2

ENVIRONMENTAL EDUCATION, AND THE DEVELOPMENT OF AN HOLISTIC UNDERSTANDING OF THE ENVIRONMENT

" Sustainable living offers the best long term prospects for a new, just, socially equitable and environmentally sound society" (Yeld, 1993:64).

2.1 Introduction

As has been previously stated, Swedish schools have, in general, undertaken a broad based, systemic, approach to education. South Africa is, at present, in the process of adopting a similar approach. The aim of this chapter is to assess the importance of such an approach in the development of an holistic understanding of the environment. It is argued that the environment is a system and if children are to attempt to understand the complexity of environmental issues, they must engage in systems thinking (Wylie, Sheehy, McGuinness and Orchard, 1998), generally described as the ability to see the world as a complex system, in which it is understood that 'everything is connected to everything else' (Commoner, 1972). Such an understanding is widely believed to be essential for the development of environmental attitudes, values and behaviours that will promote and support sustainable living (Palmer, 1998).

Attention is also drawn to the related practice of using 'environment' as a cross-curricular theme, as employed at numerous Swedish schools since 1980, and today within South Africa. A review has been undertaken of the appropriate environmental education (EE) literature, specifically focusing upon the South African situation. In this regard, an attempt is made to clarify what is meant by 'environmental education', the evolution of which within South Africa, is briefly traced, while some of the challenges that it poses for educators is discussed.

2.2 Academic Subjects and the Fragmentation of Knowledge

Within South Africa, up until the initiation of 'Curriculum 2005' in 1997, the school education system centred on the retention of information and theory, rather than application and practice. The syllabus was content-based, and broken down into separate subjects. Integration of the information provided was not required or, especially, encouraged. Instead, rote learning and the regurgitation of information was necessary, with minimal comprehension. This approach has not served to promote an understanding of the interdependence of the cultural, economic, social, and natural components of the environment. It follows then, that one of the factors aggravating environmental problems in South Africa, may be the fragmented view that people have of the world around us, propagated in school, through the separating out of reality into distinct, academic subjects.

In contrast to this 'separate subject' approach to education, Curriculum 2005 is a broader-based education system, wherein subjects are grouped together within eight 'Learning Areas' or categories of study. These learning areas are designed to give the student maximum access to life-enhancing skills. This approach might be expected to facilitate a much firmer grasp of the fact that everything on our planet is in some way interrelated, and hence, have positive effects upon the environmental understandings of people and, ultimately, upon their habits.

An important outcome of a 'broad areas of study' approach to education, which reflects the inter-relatedness of all aspects of our environment, is a more realistic and holistic

understanding of the world, as a single system (Lotz, Tselane and Wagiet, 1998). Such an understanding is essential for the integration of diverse knowledge and skills for the solving of environmental problems (Janse van Rensburg and Lotz, 1998). In fact, of all the requirements necessary for sustainable living, the first and foremost may be that the environment is viewed, not as being composed of separate parts, but as an integrated whole. Thus, the old approach, which viewed subjects as independent units of close-ended information contrasts with Curriculum 2005, which ideology parallels the belief that our world is composed of innumerable, interconnected systems, that are constantly changing.

One of the focal points of this study is the fact that from an original 13 or 14 subjects, skills and knowledge are now developed within eight broad areas of study, namely:

1. Language, Literacy and Communication;
2. Economic and Management Sciences;
3. Mathematical Literacy, Mathematics and Mathematical Sciences² ;
4. Life Orientation³ ;
5. Arts and Culture;
6. Technology;
7. Human and Social Sciences; and
8. Natural Sciences.

2.3 The Swedish Education System

The new South African approach, above, is similar to that taken by Sweden, to compulsory school education, from 1980 onwards. Social Studies and Natural Science are two of the broad areas of study that have been defined. Social Studies includes the information and skills to which students were previously exposed under the following distinct subjects:

- Geography
- History
- Religious Studies
- Civics

Likewise, Natural Science encompasses:

- Chemistry
- Physical Science
- Biology
- Technology

(Note: In 1994, a new curriculum (Lpo 94) was set in place, which encourages Swedish schools to provide individual grades for each academic subject, whether taught within the broad subject areas, or as separate subjects.)

2.4 An Environmental Education Orientation within Curriculum 2005

South Africa has embarked on a radical form of an integrated curriculum, implying that not only does integration occur across disciplines into learning areas but also across all eight learning areas in all educational activities. It is believed the outcome of this form of integration will be 'a radical transferability of knowledge in real life' (Senior Phase, 1999).

² See Glossary.

³ See Glossary.

Such integration implies the grouping of specific outcomes⁴ (and assessment criteria) under particular broad themes known as phase organisers⁵, which indicate emphasis in a given phase - Foundation, Intermediate or Senior - and which are used to develop a comprehensive learning experience that integrates with all other learning programmes. There are six phase organisers, or key organising concepts, within Curriculum 2005, including Environment, Society, Personal Development, Communications, Health and Safety, and Entrepreneurism.

As has been the case in Sweden and is, for the first time, in South Africa, 'environment' has been recognised as a cross-curricular theme or phase organiser, and is very strongly represented in Curriculum 2005. This means that in any learning programme for all phases during the first nine grades, environment can be the focus of learning, integrated into all learning areas. Thus, environmental education is viewed in South Africa, as is the case elsewhere, as the embodiment of a philosophy which should be pervasive, rather than a 'subject' which might be separately identified (Palmer, 1998). To support this environmental education orientation, there is a critical need for teachers and other educators to receive education and training, materials, and support structures, that are not only based on their expressed needs, but are also based upon an holistic interpretation and understanding of the 'environment'.

2.5 Broadening the view of 'Environment' and of Environmental Education

An impression gained during informal discussions with Swedish teachers, and members of the general public, is that many people associate the term 'environment' with the natural environment alone. In this regard, it is recognised internationally that narrow approaches to environmental education which view the environment in terms of ecological support systems and biophysical processes, do not provide adequate solutions to complex environmental issues (Janse van Rensburg and Lotz, 1998). A broader perspective must, thus, expand the scope of environmental education to include democracy, peace, conservation and development, within an historical context (Janse van Rensburg et al, 1998).

Environmental Education (EE) is, therefore, a term that, today, may be more confusing than useful. This is partly because of the wide range of definitions that have been bestowed upon the 'environment'. As indicated above, when referring to 'the environment', many individuals include only nature within their definition. Others may include physical or man-made components, while yet others may include social, economic and/or cultural aspects. The term 'Environmental Education' is similarly plagued with such misunderstanding and, in South Africa this is particularly so, because EE has, for a long time, been carried out in nature reserves, and similar areas, where human impact upon the natural environment has been the main focus. So, although many educators would agree that the environment is composed of 'interacting biophysical, social, economic and political concerns' (Janse van Rensburg and O'Donoghue, 1995), the term Environmental Education is still likely to result in some uncertainty.

'Education for Sustainable Living' might be a possible alternative, because no matter how little agreement there is with regards the meaning of 'Sustainable', the term does indicate the importance, and inclusion, of all aspects of life and living; our economic, political, social, and other, activities and systems. EE is thus adopted here as a recognisable shorthand for education for sustainable living. And, although, it is open to many interpretations in the formal sector (Vare, 1998) for the purpose of this study, EE is seen in broad terms and embraces ecological issues, development practices and social concerns. No matter how these environmental aspects and issues are presented to children, their connections and links with one another must be made obvious.

⁴ See Glossary.

⁵ See Glossary.

This is critical if the ultimate aim of EE is to be achieved; to enable people to make informed choices which will lead to more sustainable living practices and lifestyles.

2.6 Assessment of the Environmental Education Process

Assessing the ability of children to make informed choices and take environmentally responsible actions is an essential component of all EE processes. In this regard, curriculum 2005 is an outcomes-based education and, as in many other countries, is linked to a need for transformation in society. Outcomes provide the organising framework for creating this integrated education system (Mosidi, 1997). The Department of Education has defined a range of specific outcomes, organised according to the eight Learning Areas, indicating the competence expected of a learner at the completion of Grade 9. Specific outcomes specify the skills, knowledge and values that a learner should possess at the end of a learning experience, at all levels of learning, within each Learning Area. To ensure that these are achieved, assessment is required of each individual learner.

Assessment is also of critical importance in order to ascertain the quality and value of the education process in general (Lotz, Tselane, and Wagiet, 1998), and of environmental education in particular. In this regard, reliable assessment procedures are essential for teachers to gather evidence of a learner's developing competencies, including his/her environmental understanding, attitude, values, skills and commitment. While the first promotion requirements and national assessment takes place at the completion of grade 9, Lotz et al (1998) believes that there needs to be ongoing assessment throughout the school life of a learner.

Concluding the senior phase with national assessment and the possibility of obtaining national qualifications creates a danger that the importance of attaining the unit standards required for this qualification becomes so great that it will have a negative effect on holistic learning in general, and on the integration of related areas of learning, and of theory and practice in particular (Senior Phase, 1999). In this regard, Lotz et al (1998) stress that activities should be responsive to the needs of the learners and the environment in which they live, rather than being 'assessment driven'. This is essential for an open, responsive process of teaching and learning to take place. It will be essential for teachers to ensure that integration, of learning areas and of theory and practice, still takes place, an outcome of which is hoped to be the development of an holistic, or systemic, understanding of the environment.

Such an understanding, however, does not seem sufficient on its own to ensure a transformation of attitudes, values or actions necessary for sustainable living. Rather, it may be seen to serve as a foundation for environmentally responsible behaviour. The ability to act in an environmentally responsible manner is widely believed to require the direct and democratic involvement and participation of children not only in relevant, meaningful, hands-on experiences but also in the educational process itself. This has been the case in many Swedish schools since 1980 and is, then the focus of the next chapter.

Chapter 3

EDUCATING CHILDREN FOR THEIR (DEMOCRATIC) PARTICIPATION IN SUSTAINABLE DEVELOPMENT

“...our ultimate goal should be to make the linkage of schools and their curricula to community development a universal of basic education....” (Hart, 1997)

3.1 Introduction

This study has been conducted in the belief that the most sound approach to ensuring that sustainable living becomes a reality for all lies in the establishment of a citizenry that understands, and cares about, the management of the environment, and which, importantly, can operate in a highly participatory manner in democratic communities. As a possible step towards achieving this goal within Sweden, schools have been encouraged to employ group work as an educational, and democratising, teaching method, and to give pupils opportunities to gain hands-on experience of their local environment. South Africa too is in the process of adopting group work as a school-based method, while local environmentalists are encouraging greater use of the school and its surroundings for more relevant (contextual) environmental education.

As stated within Agenda 21 of the UN conference in Rio (UNESCO-UNEP, 1992) and as is the standpoint adopted in this work, it is critical for all people, both young and old, to be empowered to participate in the transformation of their communities. This, it is hoped, will lead to the eventual creation of a new, socially equitable South Africa. Hence, this chapter serves to assess the impact that group work, the provision of opportunities for participation in classroom decision-making, and the contextualisation of activities, within environmental education programmes, may have upon the transformation and, ultimately, the sustainable development, of communities. This chapter also provides a discussion of some of the challenges that sustainable development poses for educators who are involved in the design and implementation of environmental education programmes and processes within curriculum 2005, as they attempt to facilitate an improvement in the quality of life within underserved/underprivileged communities, while maintaining a decent quality of life for those who already enjoy it.

3.2 Contextualising Knowledge and Learning

This study has been undertaken in support of the belief that it is not possible or desirable for EE content matter to be structured and presented to learners using hierarchical levels of universal goals and objectives (Marcinkowski, 1991, as cited in Wals and Alblas, 1997). Rather, it questions the value and status of such goals and objectives, and puts emphasis on contextual development of EE within the school community, as does Wals (1994).

It is not easy to design educational activities or learning programmes which make students recognise the value of, for example, becoming critical, ethical or responsible for one's own actions. Part of the problem seems to be that many teachers are quite unfamiliar with what their learners value or find important (Wals *et al*, 1997). It has been concluded by a number of teachers that usefulness or practical relevance is a key criterion for engaging students in environmental issues (Wals *et al*, 1997).

Within Curriculum 2005, there is no longer a fixed syllabus or a body of predetermined knowledge to transfer. Teaching and learning is guided by the progressive development of competence towards the achievement of specific outcomes. This requires that knowledge becomes more contextualised. In this respect, children are not expected to conceptualise a theory in a vacuum but rather to organise their knowledge according to the direct relevance it contains. Thus, an integration of knowledge is aimed for, where learning is relevant and connected to real life situations. This approach is supported by a recent study, indicating that young people place most trust in information about the environment which they gain through personal experience or from people living in their own area (Connell, Fien, Lee, Sykes and Yenken, 1999).

Due to financial and time constraints field excursions are often not possible for schools, but hands-on activities and exploration of the local environment may enable the achievement of many important outcomes. As has been found in Sweden, the school grounds and surroundings can be very useful resources for environmental education. Many different environmental education processes can take place in and around the school where a diverse range of places, people, animals and plants can provide learning opportunities. In this regard, there are many useful material resources available (Jenkin and Schudel, 1998) to assist teachers and learners to make use of the school grounds. There is, however, a further need for the development of materials which will not only enable the use of the local environment as a resource but will facilitate the participation of children in the sustainable development of their communities.

3.3 Participation as a Prerequisite for Sustainable Development

Today it is generally acknowledged that development and the environment are inseparable (Ngobese and Cock, 1995), and that for the environment to be maintained in a healthy state, development is necessary. In terms of development theory, the concept “sustainable development” has emerged as a leading principle in the nations of both the South and of the North. It is, however, subject to a number of criticisms, chiefly because of the fact that it is a concept that can mean different things to different people (Jacobs, 1994). There is, however, a mainstream of sustainable development thinking (Lele 1991), formed from three documents: the World Conservation Strategy (IUCN 1980), Our Common Future (Brundtland 1987) and Caring for the Earth (IUCN 1991).

The essence of sustainable development is to keep choices open for future generations (Commonwealth Secretariat, 1991: 27). Thus, in order to ensure social justice and long-term environmental security, inter- and intra-generational equity considerations should become a major thrust of all development projects (Ngobese et al, 1995) and educational programmes. However, as expressed to varying degrees in each of the above documents, and as is widely acknowledged, development can only be sustainable and/or effective through the active involvement of the individual, drawing on the person’s own experiences and motivating him/her by helping to satisfy a human need. Development, in other words, involves a person or a group of people becoming sufficiently empowered so as to be able to have the confidence to identify and solve their own problems and needs. As a principle, therefore, development involves the whole population in the context of its everyday life. Effective community participation is central to this in the definition of problems, decision-making, and action taken to change and improve the determinants of a good quality of life. In this, it is the author’s belief, children need to be involved and enabled to participate.

3.4 Preparing Children for Participation in a Democratic Society

It is increasingly being recognised that if people, adults and children alike, do not participate in decisions taken on transformations that are necessary within their communities to improve their quality of life, then the impact of such change is not likely to be sustainable (Farrington, 1993). For community-based environmental planning and management it is important to involve children (Hart, 1997). In this regard, the author holds the view that if learners are provided with the opportunities for becoming authentically involved in research, planning, design, management and monitoring of the environment their participation can make such environmental/development 'work' more effective. Thus, there would appear to be a need for appropriate environmental education programmes and activities for the building of the capacity of children to plan and manage environmental and development projects initiated by themselves, their communities and local government. Furthermore, as there is often a need for local groups to be established for the discussion of proposals for change there is a consequent need for children, as members of the community, to receive education "for democracy".

In this regard, it is widely acknowledged that there is a great need for educational and training programmes to prepare people for decision-making roles and positions in their communities, and that young people, in particular, need to be equipped for 'greater participation in political and social processes, and... (be provided with)... the knowledge they need to be able to create, manage and maintain a democratic society' (Ellis, 1993: 14). The author of this paper maintains the belief that this holds true at the school level, where the "democratisation process" needs to be initiated. Thus, an important focus for this study is the development of EE programmes and processes that are capable of building the capacity of children and, ultimately of their communities, for participation and democracy. In this regard, environmental education programmes need to be participatory, ensuring that the learners themselves play a more active role in choosing topics for investigation, identifying needs, discussing and solving problems, and evaluating results (Johnson, 1993).

Of further direct concern, therefore, is the associated educational method of dividing classes up into small, functional groups, forcing the participants to interact with each other. It is the values which this method aims, ultimately, at reinforcing - tolerance, democracy, and a willingness/ability to work co-operatively within the framework of a group - that are of central interest. As in Sweden, it is collaborative, rather than competitive learning which is endorsed. Group work allows for issues to be discussed rather than being simply presented by the teacher (Hansson, pers. com. 1999). And if group participation is effectively managed, it can motivate the learner to engage more effectively with the material through a shared vision of the proposed outcome.

A recent Swedish study supports this view, concluding that if 'pupils are given the opportunity to practice democracy in school, for instance through becoming proactively involved in its curriculum development process, and are given the opportunity to develop social competence, the chance of increasing their positive view of the future will become a real possibility, as will the possibility of their being able to influence future societal development by taking an active part in its democratic processes' (Oscarsson, 1996: 276)

It will be important to examine if learners feel they can influence their situation, if they have the desire to do so, and if they know what they need to do to accomplish this. Pawlowski (1996) believes that the perceptions held by young people both of environmental problems and of their role in solving them is of great importance for two reasons: first, in the near future they will have a great influence on the running of business and, second, knowing what they think about environmental issues will help to establish better pro-environmental education among them.

3.5 Building Strong Local Democracies through Community-based EE

In many parts of the world ‘development’ is still equated with economic growth or an increase in industrialisation. Recently, however, there has been a movement towards an alternative, more ‘people-centred’ vision of development (Korten, 1990), which merges the concept of sustainable development with issues of social justice and equity in the distribution of resources and inclusiveness in decision making. To achieve a people-centred vision will require the building of strong local democracies which, in turn, requires great changes in the way the public views its role in development.

For the above to become reality, children need to be given directed opportunities to investigate their own communities. This will increase their awareness of the need for a people-centred approach to development, as well as allowing them to develop a sense of shared responsibility and skills that will enable them to continue to participate as adults in environmental/ development decisions. This fundamental democratisation of children may be, as Hart (1997: 8) states, ‘the most important aspect of their participation in the environment of their communities’.

The impact that EE has on a learner and, subsequently, upon his/her community is, however, dependent upon a number of factors, amongst which the most important may be the teaching methods used. For this reason, an interview survey was carried out on an individual basis with teachers directly involved in the implementation and/or development of EE. The following chapter, therefore, focuses upon the research techniques adopted in order to gauge the perceptions that teachers (in and around the city of Lund) may have of the importance of the various teaching methods upon which this study is focused.

RESEARCH METHODS

4.1 Introduction

The underlying aim of the research methods adopted in this study is to ascertain how the teaching methods or approaches listed below, upon which this study focuses, can best be used to promote effective environmental education. Thus, the focus is upon the use of the environmental theme when:

- teaching within a system wherein subjects are generally integrated under broad subject areas, such as Social Studies;
- contextualising knowledge, through activities and projects centred in the local environment and/or associated issues;
- using group work, especially when investigating environmental issues; and
- providing pupils with opportunities to participate in decision-making, i.e. in choosing topics for investigation, lesson content, activities and projects, and action to be taken.

In order to provide a comprehensive answer to this 'question' a pilot study was undertaken, involving the *Naturskolan*, a local environmental education organisation, and schools, in and around Lund, situated in southern Sweden. The purpose of this initial study was to provide some direction for the primary data collection. This was by way of semi-structured, personal interviews, carried out with local school teachers.

4.2 Pilot Study

The pilot study was based upon both a questionnaire survey and a small number of interviews. The questionnaire was compiled and issued to schools, or sent via electronic mail, for the attention of those teachers who had, since 1980, been involved in EE at one time or another.

The initial questionnaire was then followed up with a series of interviews, carried out amongst school principals, and staff members at the *Naturskolan*. The results obtained served to provide some measure of the relevance and validity of research questions, concepts, variable selection, and techniques for data collection. One finding of particular importance is the fact that because the questions were posed in English, many were easily misunderstood or misinterpreted. A further critical realisation was made, being that a number of schools have chosen not to integrate subjects under the broad subject areas of Natural Science and/or Social Studies. The result of this is that many teachers have little or no experience of the benefits or disadvantages of such an integrated education system when implemented in combination with the other methods under focus.

4.3 The Interview Scheme

After further development and refinement of the research design, the primary data collection was undertaken with school teachers involved in EE. Thus, the pilot study was followed up with the personal interview, divided up into topics, or sections, within which related questions are posed. In this regard, the semi-structured interview was the method which was felt to be most likely to elicit honest and comprehensive answers, in English, to the questions asked.

In order to describe and discuss the importance of the educational approach under evaluation for effective EE it was felt suitable to rely on the perceptions of teachers. As such, it should be acknowledged that human perceptions and attitudes are complex in nature, and are not easily translated into language. Furthermore, people who do not speak English as their first language, may struggle to accurately translate their thoughts directly into English. Both of these facts impose major constraints on the study design. Thus, in order to develop an accurate measure of the perceptions of teachers, it was decided against using a questionnaire survey, in which responses may be "narrowed" by the answer options. The interview was, therefore, the methodological technique adopted, structured in such a way so as to provide the interview respondent with an almost infinite range of responses to choose from.

4.4 Interview Participants and Procedure

Fifteen (15) teachers (Appendix I) were interviewed, in order to obtain qualitative descriptions of the EE undertaken. Rather than recording such descriptions on tape they were, instead, directly transcribed. This process involved a minimum of two interviews at six schools in and around the city of Lund. Of the teachers interviewed, six have been involved within the Social Studies (*SO*) area, while nine have been involved within Natural Science (*NO*). Due to the limited size of the sample (15), the results have little statistical significance. The significance lies, rather, in the fact that the responses elicited, in reply to the questions posed, are the individual's stated perceptions of EE within the educational system.

4.5 Data Analysis

As stated previously, the purpose of the interview is to ascertain how the teaching methods listed above, can best be used to promote effective environmental education, i.e. the effective use of the environmental theme. This raises the critical issue of assessing the effectiveness of EE. For the purposes of this study the effectiveness of EE is seen in terms of its ability to generate environmentally sustainable understandings, values, attitudes, actions and habits; the 'environmental responsibility' of a learner. It should be borne in mind that little research has been carried out in Sweden into the links between school-based EE and improvements observed in the sustainability (and quality) of people's lives in the local communities.

It should also be noted that there appear to have been few attempts, within Sweden, at obtaining any sort of measure of the effectiveness of school-based EE; the change in children's environmental understandings, attitudes, values and habits. This is largely the case at present. Thus, the findings of this study are based solely upon the perceptions that individual teachers have of the effectiveness of the EE with which they have been involved.

In this regard, it is acknowledged that the effectiveness of EE does not depend only on the teaching methods under investigation but on a variety of other factors. These include the EE 'content', the support of the school principal and parents, and the teacher's environmental knowledge, amongst many others. Thus the interview is structured to provide further opportunities for interview respondents to raise, and discuss, such factors. And although many are included, there will, nevertheless be a number of potentially important factors, within the South African context, which will only be touched upon briefly, if at all, by the interview participants.

In this regard, it is felt important to stress that it is solely the responses received, that are summarised within the following chapter. They are then analysed in terms of the applicability and appropriateness of the methods under focus, to the South African situation, and the implications for the future development of EE within a similar integrated educational system.

Chapter 5

RESEARCH FINDINGS

5.1 Introduction

This chapter presents the findings that have arisen as a result of the interview survey (Appendix II), undertaken with teachers in and around the city of Lund. It provides qualitative descriptions of the EE carried out, and is divided into four sections, building a comprehensive picture of the relative advantages and disadvantages of a broad-based, integrated approach to school education.

First, the focus falls upon the effectiveness of EE (the use of the environmental theme) and the assessment thereof. In the second section, the focus is on the contextualisation of knowledge through the undertaking of investigations, activities and projects within the local environment and/or community. The third section focuses upon the EE processes that are believed to promote an “active optimistic future orientation” (Oscarsson, 1996: 261). Such processes involve the related practices of providing learners with opportunities both for participation in classroom decision-taking and for the development of democracy-supporting values and attitudes. In the fourth and final section, the focus falls upon ‘teacher support’ and those other factors which are believed to directly influence the ability and/or commitment of teachers to implement effective EE.

It is hoped that by recording and assessing the experiences of Swedish teachers this study will enable South African teachers to side-step some of the problems that have been experienced, while improving upon those methods that have been found to be effective. Further, the results of this investigation may provide some direction with regard to points of focus within future teacher training programmes and mechanisms of support for the implementation of effective environmental education.

Hence, this work has a somewhat limited but nevertheless important role; namely to direct the development of EE, within the South African education system, such that teachers can best direct the skills and knowledge gained by learners to bring about change for the sustainable development of South African communities.

5.2 Assessing the Effectiveness of EE within an Integrated Education System

The first section (Appendix II: A) of the interview includes a question which encourages the respondents to look back over time to the implementation of Lgr 80 and explain how changes in the environmental knowledge, attitudes, values and habits of learners have been assessed/evaluated.

The responses received to this question indicate an almost complete absence of formal assessment methodologies because, it seems, it is usually “not thought necessary” and, as one respondent remarked, “there is little time for assessment”. Further, in the opinion of the majority of teachers it is adequate to rely on the “general comments” and actions of the children as a measure of their environmental awareness. With regards to actions outside of the school grounds and at home, a number of teachers remarked that feedback was occasionally provided by parents, and should be further encouraged.

Respondents were then asked to indicate what they perceived to have been the factors that may have made EE more, or less, effective at generating environmental responsibility amongst learners.

As an outcome of the lack of formal assessment procedures and evaluations, teachers were not, generally, able to state categorically that EE had become more effective or not. Those who felt it had improved were in common agreement that this was due mainly to the fact that environmental issues had, since the early 1990's, become very widely reported on TV and in the local press, especially after the setting up of a Local Agenda 21 information office in town. The result of this has been an increase in the general awareness, and levels of knowledge, of environmental issues and topics of the local teachers and public.

With regards the importance of broad subject areas for effective EE, this was mentioned, without provoking, on no less than three occasions, one of which involved the following comment:

“When subjects are integrated within subject areas, such as with the SO (Social Studies) subjects, the environmental theme is much more effective, because one can look at environmental issues and problems not only from the biological aspect but from the social aspect as well. This enables one to look at how society can solve problems... One presents a very narrow view of problems and issues when subjects are separate. This is very ineffective.”

The general consensus, however, is that the effectiveness of EE depends more on the motivation of individual teachers than on any 'external' factor.

Respondents were then requested to detail the 'social' themes and issues that they had incorporated into their learning programmes. In general, the 'social' themes, such as alcoholism and drug use, gender equality, etc, and other similar issues are used to a very much lesser extent than the environmental theme. This is partly because social issues do not seem to be perceived by either the general public or media to be of as much importance as issues concerning the natural environment. This is entirely understandable in a country such as Sweden where social problems appear to be relatively few and far between. In this regard, the use of social themes is dependant to a large extent “on what is happening in the local environment, and on what is reported in the newspapers”.

Global social issues, on the other hand, receive more attention. The use of articles in the local newspapers was again commented upon as an effective way in which to focus discussions and investigations. Issues that are commonly focused upon include the ozone layer, greenhouse effect, loss of rainforests, living habits of people in Sweden and elsewhere, poverty in the 'third world', and the “differences between the poor and the wealthy countries”. Importantly, however, the comment was made on a number of occasions that global issues are often found to be “paralysing” for children leaving them “sad and depressed” and/or disinterested.

5.3 Contextualising knowledge through Local Activities and Projects

Under this section (Appendix II: B) questions are posed in order to gain a clear picture of the local issues investigated and the methods adopted in order to make learning more relevant to the learners.

Respondents agreed, almost without exception, that the school environment in general, and the school grounds in particular were an important resource. Activities are undertaken in the grounds of all six of the schools visited, and include the planting of flowers, herbs and occasionally vegetables and fruit trees. Also, ponds have been built and benches have been erected in a number of schools. Such visible improvements have not, however, been the only activities in which children are actively involved. In at least three of the schools, pupils have investigated the waste paper produced by their school and, as a result, have been involved in organising the collection of

such waste for recycling. As such, practical activities and projects based at school can often provide quick results, which “can be very motivating for learners”. And, of all the factors mentioned as necessary for effective EE motivated learners is one which is referred to time and again.

Waste recycling and the use of water and energy are topics that many schools have attempted to extend into the homes of their learners. Tasks given to children to be carried out at home include the measuring of detergent, water and electricity usage and the planning of methods to reduce such usage.

Other locally based activities have often also extended beyond the school gates. These have included visits to the local waste water treatment plant, local industrial complexes and retailers, and local forested areas, amongst others. In this regard, investigations of issues are not only “really enjoyed by the children” but are also supported, and often initiated, by local and national environmental organisations. These have involved children in the investigation of the environmental friendliness of local stores and shops, using question sheets developed by the environmental organisations referred to above. The results of this ‘research’ are reported in one of the local newspapers, influencing the environmental behaviour of the stores involved.

An investigation into the health of a local river is another activity encouraged and supported by a national environmental organisation which, again provides the ‘worksheets’, and requests that the results be sent in to them for evaluation. This is believed to be particularly effective in generating, and holding, the interest of pupils because they see how their school work and research is of actual use, eventually generating visible results.

Interviews with local people and organisations, focusing on environmental issues, are also popular with learners at a number of schools. Interviewees have included older members of the community, members of political parties, and the Local Agenda 21 organisation.

In summary, the interview responses received to the questions in this section indicate that there is a widely held belief amongst teachers that activities and investigations carried out in the local area can play an important role in motivating pupils to learn and, in some cases, in changing the environmental behaviour of parents and other community members. As is the case with EE, there is little or no assessment of the impact of relevant learning activities - the contextualisation of knowledge - upon the environmental understandings, attitudes, values or actions of the learners.

5.4 Providing Opportunities for Student Participation in a Democratic Society

This, the third topic within the interview, focuses upon the related practices of providing learners with opportunities both for participation in classroom decision-taking and for the development of democracy-supporting values and attitudes. To begin with, questions were asked (Appendix II: C) in order to ascertain the importance of classroom democracy, i.e. the provision of opportunities for learners to decide upon EE lesson content, activities and projects.

Within the local school community there appears to be relatively common consensus on this issue. In this regard, it is widely believed that learner motivation is central to effective learning. As such, the perception expressed during six of the 15 interviews carried out, is that learner motivation and, hence, effective learning, is directly linked to the interest a learner has in the topic under investigation. Thus, allowing pupils to participate in the choice of topics that interest them is widely undertaken;

“With regards to environmental education, pupil participation is very important because it ensures that pupils are interested in what they are taught.”

The most important impact of this, however, may be “that children learn how to take decisions”, both as individuals and as members of a group.

Questions were then posed, focusing on group work, which encouraged respondents to discuss their use of this teaching method. Of concern are the real, and possible, impacts that group work may have upon the social competence of children, in general, and upon the attitudes and values of children with regards to tolerance for the views of others, and a willingness to co-operate, in particular, which are essential requisites for the smooth functioning of a (new) democracy. Of great interest are the means by which it might be possible to enhance the impact that group work may ultimately have upon the democratisation process, widely believed to be essential for a sustainable society.

In the opinion of the majority of teachers, group work is seen to be “extremely important”, playing a crucial role in inculcating social competence within their learners. As such, one of the respondents stated, during the course of an interview, that:

“Social competence is almost a subject... so group work is very important”

As with all teaching methodologies, however, there are both pros and cons to providing opportunities for classroom democracy and, to undertaking group work activities. In this respect, the disadvantage most often raised is that they are time-consuming. For group work, in particular, to be optimally effective, the interviews indicate that there is strong consensus regarding the requisites that have to be met. The following five points were especially stressed.

- a. Children must be trained how to work in groups from the time of their first few years of schooling. This was made clear by an interview respondent who felt that “not only must children have social competence”, but that “it has to start at a young age.”
- b. Supporting resources, e.g. a library, information technology (IT), etc. must be readily available. Thus, not only must children know how to co-operate and work in a group, but good resources should also be accessible.
- c. Teachers must ensure that groups are well balanced in terms of the skills and competencies of its members. For there to be effective exchange between members within a group, “teachers have to know the pupils well in order to make the groups well balanced.” Also, teachers may have “to give each group member a role within the group....so that each member feels they are needed” for the successful functioning of the group. This indicates how important it is for teachers to be familiar with such practices, hence the point below.
- d. Teachers must be trained in the use of group work methodologies. This was stressed by a teacher, who stated that: “I would like to learn how to enable the children to work effectively in groups, and how to enthuse them.”
- e. A variety of learning opportunities must be provided, including the more ‘traditional’ teaching approaches. As such, one respondent felt that in order to ensure that pupils remained interested and enthusiastic “group work is something to do now and then, but not all the time. Pupils want to work in different ways, otherwise it becomes boring.”

Should all of the above requisites be met, group work can still result in few positive benefits if it is poorly managed. A common problem is that children “often concentrate only on their part instead of becoming familiar with the topic as a whole, which means that little co-operation has taken place”. A further problem, commonly experienced, is that group work can

be noisy. For this reason a number of respondents felt that discussion rooms, or other segregated areas would be useful, as would be the assistance of a colleague.

As stated above, the pattern that emerges from the above interview responses indicate that learner motivation is central to the effectiveness of most activities and teaching methods. Group work is no exception, and “is not effective for those who are not motivated.” Thus, in the opinion of most teachers, “group work is linked to classroom democracy”, where pupils are allowed to choose the methods of investigation and, when appropriate, the topic to be investigated as well.

5.5 Teacher Support, and Other Factors, Influencing the Effectiveness of EE

This final section (Appendix II: D) includes a series of questions, that are posed in order to elicit from respondents the means by which various actors could, or should, support teachers in their implementation of EE, motivating those who lack interest and encouraging those who are already involved.

The first question that was asked of respondents referred to the role of environmental education organisations, such as the locally-based *Naturskolan*, in their support of school teachers involved in EE. The responses received to this question indicate that teachers are of the opinion, almost without fail, that the “*Naturskolan* has been very important”, particularly with regard to its inspirational role. In addition there is a great deal of consensus with regard to the organisation’s most important functions, beyond the mere provision of EE-relevant information, of which each of the following points were raised on more than one occasion:

- To provide examples and demonstrations of activities and ‘exercises’, (mentioned during 12 of the 15 interviews).
- To visit individual schools for practical demonstrations, (mentioned during nine of the interviews).
- To provide teachers with opportunities for meeting and ‘networking’ with motivated teachers from other schools, (mentioned during four of the interviews).
- To motivate school principals in their support of teachers implementing EE, (mentioned during two of the interviews).

Inservice education and training (INSET) of teachers is thus strongly perceived to be an important need, met to a large extent by the *Naturskolan*. There is, however, a strongly felt need for further provision of INSET, especially with regards to helping teachers to feel confident in their use of the environmental theme, in general, and in the use of the local environment, in particular. Of particular relevance in the South African context was the often repeated comment that training and input is felt to be important with regard to the use of new teaching methods.

“Those with traditional teacher training, having specialised in just two or three subjects, may struggle. It is very important to give teachers training, as it is often very difficult to find the links between the subjects.”

Training was also mentioned as being important for the drawing up of EE-related lesson plans, the use of EE ‘guide books’ and, especially, the use of ‘teaching teams’⁶.

It is, in fact, in the functioning of ‘teaching teams’ that respondents, once again, showed wide agreement. 12 of the 15 interview respondents felt that teaching teams were necessary for

⁶ See Glossary.

effective EE, especially when subjects are grouped together within integrated subject areas such as Natural Science. Generally, teaching teams are composed of four or five teachers from different disciplines, one of the most important purposes of which “is to find topics in common” for integrated education in general, and cross-curricular EE in particular. A further point of broad consent among respondents indicates the critical importance of training for teachers in order to provide them “with the skills necessary for working efficiently in teams” and for “effective collaboration”.

Teaching teams were felt to be important for a number of other reasons, amongst which are to:

- Indicate the range of knowledge and skills that colleagues hold, and can share;
- Indicate the common interests held by colleagues;
- Make otherwise impossible field trips (often due to large class size) a reality;
- Find common topics for investigation; and
- Bounce ideas off colleagues.

At two of schools the use of teaching teams is a relatively new phenomenon, having been implemented during the past two or so years. At such schools, teaching teams generally appear to be unpopular, in part because “they take so much time”. This perception has been reinforced in a number of cases because teachers have had to learn how to operate effectively in teams through a process of “trial and error” and, as one respondent commented: “mistakes are time-consuming.”

With regards to INSET, in general, and (pupil-based) team work in particular, a common feeling is summed up in the comment, once again: “I would like to learn how to enable the children to work effectively in groups...” It would appear that this sentiment is widely held to be equally relevant for teachers themselves. And, teachers who have attended INSET can act as mentors for the other teachers in their teaching teams, “offering encouragement, ideas and motivation.”

A series of questions was posed requesting that respondents indicate what the perceived obstacles are that prevent one from making greater use of the environmental theme. Leading on from this, respondents were then encouraged to outline further important mechanisms that were believed to be necessary for supporting teachers in EE, as well as to describe changes that would make the environmental theme more user-friendly.

Again, there is wide consensus on a number of important issues, amongst which the most commonly referred to is that surrounding the role of the principal in the implementation of effective EE. The belief that “a supportive principal is very important” was often expressed. In this regard, it is felt the role of the principal goes well beyond that of administrator and, rather, requires him or her to be an “educational leader.” Funds are important for EE activities, excursions and equipment, but “interest and encouragement” from the principal is perhaps far more crucial for effective EE.

A further issue, raised on a number of occasions, involved the belief that “Colleagues are also very important for support”. This appears to be especially so when pupils respond in a disinterested or bored manner to a planned EE activity or investigation. Supportive colleagues, however, may be more important in their willingness to accommodate EE activities that run ‘over time’ into their lesson space. In this regard, it would again appear that support is essential from the principal, who should give teachers a measure of “free reign” in the organising of timetables and lesson plans. This not only makes collaboration between teachers possible but it also “acts as a motivating force” for teachers.

It is in this respect that respondents were possibly most unanimous; that one’s “own personal interest and motivation is of most importance”. The reason for this is patently clear, as the use of the environmental theme is not compulsory (although it is strongly encouraged and supported at

the national level). An apparently common feeling was expressed by one teacher who stated the following:

“A teacher has to be motivated in order to carry out effective EE... It is very important for a teacher to feel that what he or she is doing is important for the future, and for the country. Closely linked to this is the interest shown and the support given by the principal, other school leaders and colleagues, because without this even an enthusiastic teacher can become demotivated and tired.”

Beyond the factors mentioned above, time was constantly referred to. It was twice stated that for a ‘new’ educational system to run effectively would take 20 years. In this regard, one of the respondents expressed the view that “curriculum changes are one thing , what happens in reality is another.” The lack of time, however, is widely considered to be one of the most serious hindrances to many EE activities, projects and investigations. The following comment from one active EE practitioner sums up the very widely held, and strongly felt, belief that “One doesn’t have to be lazy not to do EE as there is so much else to do. Time is a very big constraint”.

DISCUSSION

6.1 Introduction

Within South Africa, teacher education, materials development, research, and learning programme development have been identified as priority areas for action (Le Roux, Lotz, and O'Donoghue, 1998), in order to ensure the implementation of effective EE in formal education. However, as has been consistently expressed by the Swedish educators involved in this research project, and as indicated in the previous chapter, there is a critical need for teachers not only to receive education and training, while in service, but also to receive support for their 'environmental work' through a range of mechanisms and structures, that are based on their expressed needs.

Thus far, the research findings appear to substantiate the choice of teaching methods or approaches upon which this study has focused. As is indicated, however, there is a widely held belief that a number of conditions need to be met for these methods to support the implementation of effective EE within Sweden. Hence, this chapter aims to provide a discussion, around these conditions and requisites, that may facilitate the application of the above methods within the South African context and promote the development of effective EE within Curriculum 2005.

6.2 Progressing from a 'Nature Conservation' Approach to EE

School-based environmental education (EE) within Sweden appears, predominantly, to be seen as the task of educating children about nature conservation or how to ensure the natural environment is protected from damaging human actions. This has been the case in many countries (Hart, 1997), including South Africa, where the nature-oriented movement has drawn its members predominantly from the middle and upper classes. In general, they have not felt that housing, adequate parks, municipal services, opportunities to earn a living, etc. were appropriate questions to be considered by environmental educators. The integration of ecological issues with issues of human development (and survival) - employment, education, health, and nutrition - has, in general, not occurred to any large degree. Much of this is a result of the separation of academic fields and professional practice into social and natural sciences (Hart, 1997). This has been the case in Swedish schools, resulting in a strong bias towards the natural sciences with little influence of the human sciences, and few society oriented goals (Axelsson, 1997).

It is the author's belief that the environment is a concept that must become more strongly associated with an understanding of social, political and economic influences on the ecology of the planet. As such, this study accepts the standpoint taken by Hardoy, Mitlin and Satterthwaite (1993) who believe that "social sustainability" and "cultural sustainability" are extremely important contexts for the achievement of ecological sustainability and should, therefore, receive a lot of attention within formal education.

6.3 Promoting Environmentally Responsible Behaviour

The development of an 'environmentally literate citizenry' is the major outcome of environmental education; and the acquisition of responsible environmental behaviour is one of the ultimate goals (UNESCO, 1980 as cited in Hsu et al, 1998). This, it is clear, holds true within the Swedish formal education sector, within which it appears to be widely recognised that in a broad range of human activities where values, attitudes and behaviours are concerned, there is not a simple

progression from knowledge to 'informed' (environmentally responsible) behaviour (Hungerford and Volk, 1990 as cited in Dillon and Gayford, 1997).

Based upon the interview findings, there appears to be broad agreement that EE which only transfers information about environmental issues, will have very little effect on the quality and/or sustainability of people's lives. School education in general, and EE in particular, should be an ongoing process of developing, within children, the knowledge, attitudes, values, skills and commitment to resolve and prevent environmental problems. Such education, must comprise programmes of learning which view the environment as an interdependent and complex system. However, in order to ensure that children's actions are environmentally responsible, flexible learning programmes need to be developed in order to allow sufficient local choice to enable the associated activities to be relevant and meaningful to the learners, enabling them to be active participants in the transformation of their communities.

In this regard, it would appear that teachers are relatively consistent in their wish to provide practical and relevant learning experiences on a regular basis. This would include greater use of topics that are accessible and observable within the school grounds and surrounding community and the associated undertaking of appropriate activities.

Within Sweden, however, the way to measure the effectiveness or success of a teacher's EE activities, in generating environmentally responsible citizens, is not given and the learning produced is therefore not assured, i.e. there are no commonly prescribed procedures for assessing how pupils come to see, understand, or interact with, the environment (Axelsson, 1997). This lack of evaluation may, in the future, be a serious impediment to the improvement of programmes.

6.4 Improving the Environmental Knowledge of Teachers

There appears to be wide support for Hart, (1987) and Spark, (1992), (as cited in Papadimitriou, 1995), all of whom contend that for both the implementation of EE in schools and its quality, the key factor is the teacher her/himself and not simply the curriculum materials. As such, critics of EE have argued that teachers must have a comprehensive knowledge of environmental concepts to be better environmental teachers. This view was reinforced by the widely stated belief of interview respondents, that environmental information is one of the critical needs that teachers have for effective EE. In this regard, it is expected that if teachers have a more refined conception of what EE entails, they will feel equipped to include it within their existing curriculum. However, disagreement among researchers and theorists about what constitutes EE only compounds and confuses the situation for classroom teachers (Robertson and Krugly-Smolka, 1997), acting as a demotivating force.

Teachers are, of course, those who are in the best position to develop EE programmes based on local, real environmental issues from which students can learn how to act to find a solution (Blum, 1987, as cited in Hsu and Roth, 1998). However, the knowledge, skills and values that teachers attempt to impart during their EE learning programmes and activities is evidently greatly influenced by their own environmental literacy. Therefore, the author of this paper is in agreement with Hsu *et al.*, (1998) who believe that at the local level it is essential for EE educators and researchers to assess and promote the environmental literacy of local school teachers. The findings of this study indicate that this is particularly so, as teachers who do not have the required levels of knowledge may well be too afraid of failure to even attempt using the environmental theme in their lessons. Support from the principal for a teacher's EE attempts, no matter how tentative or exploratory they may be, is thus essential in order to maintain the interest and motivation of that teacher.

6.5 Building upon the Interest and Commitment of Teachers

Recent research (Wickenberg, 1999) supports the perception, gained during the course of interviews, that individual and personal basic values, feelings and commitment play a large and probably decisive role in the environmental education undertaken by teachers. The teachers and principals collect their driving force and desire from their personal commitment and their private views on the environment, carrying this to the professional sphere of the school (Wickenberg, 1999). Findings made during this study strongly indicate, however, that for commitment to be sustained teachers need the emotional support of their colleagues in general and of the principal and other school leaders in particular.

A teacher's level of commitment is also influenced by the fact that he or she is a public servant of the community, with the accompanying responsibilities, duties and expectations of engaging in activities corresponding to the basic democratic and ethical values of society (Wickenberg, 1999). Thus, an important barrier to EE activities is the common feeling shared by teachers of whether they have permission to carry out the activities, often controversial, which they feel constitutes an effective use of the environmental theme. It seems that there are often societal influences which ensure that teachers avoid opening such 'controversial' issues in the spirit of EE (Robertson et al, 1997). In this regard, the following, and final, chapter attempts both to draw some conclusions, and to provide recommendations for the support of South African teachers who may not only face such society-based obstacles, but who also are in the process of implementing an entirely new school curriculum.

CONCLUSIONS AND RECOMMENDATIONS

7.1 Introduction

The motivation for this study has been that if a fundamental aim of environmental education (EE) is to enable children to understand, appreciate and care for the environment as a whole, then teachers and, in particular, those responsible for training and otherwise supporting teachers within Curriculum 2005, should be familiar with the advantages, disadvantages, opportunities and possible pitfalls associated with the four specific teaching methods focused upon. These methods are those that have been applied within Sweden and are now in the process of being adopted in South Africa, and are widely believed to be essential for the development of active and informed minds and, ultimately for the building of a democratic and sustainable society.

This work has focused upon the experiences and observations of Swedish teachers as expressed during the course of comprehensive, semi-structured, personal interviews. By recording and assessing these experiences and observations this study hopes to enable South African EE practitioners, curriculum developers, decision-makers and educators in general to side-step some of the problems that have been experienced, while improving upon those methods that were found to be effective.

In the literature reviewed within Chapter 2, there appears to exist a general consensus that the development of an holistic understanding of the environment through the integration of traditional subjects into broad learning areas, and the associated method of using the 'environment' as a cross-curricular theme, are important for effective EE.

Chapter 3 provided a review of literature pertaining to two further educational methods that are believed to support EE at the school level. These include the use of group work methods, and the associated practice of providing opportunities for 'classroom democracy', and the contextualisation of knowledge through the use of the local environment and/or local issues as the foundation for EE activities and learning programmes. A level of consensus has been reached, at the international level, with regard to the importance of enabling people to participate in environment and development initiatives. It is acknowledged that the two methods mentioned above, in particular, can have a positive effect on the ability of children to participate and, hence, upon the broad promotion of sustainable living patterns.

The interviews conducted during the course of this study have resulted in a number of findings, one of which is the fact that the effectiveness of EE is closely linked to the implementation of the above teaching methods. It appears that the use of these methods are in turn dependant, to a very large extent, upon the environmental interest and motivation of the individual teacher who is, for all intents and purposes, entirely responsible for developing, implementing and updating EE activities and projects. Critically, however, interview responses clearly suggest that teacher motivation, and commitment to EE, is governed by a number of factors and processes, many of which are not in their hands. Such crucial limiting factors include:

- the extent to which the school principal, other school leaders, and colleagues have an interest in and support EE;
- the availability of relevant environmental information and examples of EE activities and exercises;

- the availability of in-service education and training (INSET) for teachers, particularly in the field of teacher co-operation and collaboration within school, and in the use of group work and other methodologies; and
- the availability of time to plan and implement EE activities, cross-curricular or otherwise, with colleagues.

7.2 Recommendations

This section includes recommendations that are made in the light of the above findings, in the hope that they will facilitate the effective use of the methods upon which this study has focused, and promote the development of impactful EE within Curriculum 2005. Importantly, these recommendations are made while bearing in mind that EE should be developed while considering the specific ecological, cultural, political, educational and economic conditions experienced within a country (UNESCO, 1980, as cited in Hsu and Roth, 1998), in this case South Africa.

Supporting Teachers in New Educational Approaches

With the major transformations that the South African educational system is presently undergoing it is important to bear in mind the widely held belief that it is the teachers who are central in all educational change (Axelsson, 1997). It is possible that due to the constraints imposed through large scale educational reorganisations, as was experienced in the Netherlands after their new curriculum was set in place, the possibilities for a successful implementation of EE lie within narrow margins (Brijker, de Jong and Swaan, 1995). A supporting programme is therefore essential, focused on removing the impediments that are signalled by the teachers. A critical element has been found to be the improvement of the quality of communication: better information is needed on regulations and on possibilities for EE; on available materials and the way they may be used (Brijker et al, 1995) and on the possibilities for co-operating with colleagues who teach in other subject areas.

In this regard, structures are required within schools to ensure that teachers provide practical support for each other, sharing problems, solutions and even lesson time. Within South Africa, however, there will probably be important barriers to such co-operation and collaboration; mainly professional and psychological barriers of 'single discipline'-trained teachers who are not used to such a 'new' educational approach, involving inter-disciplinary co-operation. Appropriate training will thus obviously be required in order for teachers to overcome these obstacles.

Empowering Children to Participate: A New Focus for Teaching and Learning?

As has been stated, the active participation of the general public, including children, is a key factor in preventing and solving the environmental problems experienced today (UNESCO, 1978a, 1988, as cited in Hsu et al, 1998). However, before designing effective EE programmes to foster and promote responsible environmental behaviour, it is necessary to investigate the variables that are important in the development of a child's responsible environmental behaviour. In this regard, the impact that poverty and powerlessness often have on children's desire and capacity to change must be borne in mind during the development of EE activities and projects. Adolescents will reach the desired level of environmental knowledge and behaviour only if they are willing and able to learn. As such, it is believed that environmental consciousness will vary with socio-economic status (Hampel, Holdsworth, and Boldero, 1996). This is of crucial importance within South Africa because, as Hart (1997) points out, poverty and experiences with discrimination and powerlessness have often been found to be very damaging to children's sense of self and their capacity to change anything.

If South Africa's new approach to learning is to empower children, from all social strata, to undertake environmentally responsible actions, one-way communication and/or linear modes of reasoning, as were common practice, do not appear to be appropriate or effective (Hutchinson, 1997). In relation to EE, the conventional (South African) model of teaching, in which the teacher pours out his/her knowledge into the empty vessel (learner), denies reflexivity and greatly undervalues the impact of co-learning (Hutchinson, 1997). However, to change the 'repertoire of teaching', from a repertoire of transmission to a repertoire of transaction, is far more difficult than to change the 'repertoire of content', and is difficult to learn and feel competent in (Axelsson, 1997).

Directly linked to this is the fact that it is becoming widely acknowledged, and is patently visible in South Africa, that the current problems which contribute to an unhealthy environment are not problems of nature but rather social problems, directly linked to people, their history and how they relate to their local environment, and the wider world (Mosidi, 1997). In this regard, measures need to be taken to ensure that EE is not seen as the sole responsibility of those who had taught biology within the previous South African educational system. Thus, for high quality and effective EE, this once again emphasises the critical need for both inservice education and training, as well as support and encouragement of teachers, particularly during the implementation of group work and other 'new' teaching methods.

Forming Alliances between Schools, Training Institutions and Individuals

Providing further support for the belief that teacher training is critical, a recent survey of African education officials cited teacher training programmes and curriculum reforms as the two most important activities for improving EE provision in their countries (Vare, 1998). In this regard, an important research question that needs to be answered is what kind of training and professional development in EE do teachers need and which process should be followed?

Possibly those in the best position to clarify what kind of inservice education and training of teachers is required are the institutions and organisations, many of them non-governmental, who have in the past focused all, or some, of their activities and resources upon environmental education. These organisations will generally have the background knowledge that is required for the development of appropriate training programmes and support services.

In this regard, interview responses strongly suggest that locally-based environmental organisations can play a very important role supporting teachers. It should be borne in mind, however, that demand for support and training is dependant, to a large extent, on how the school principal and other school decision-makers view EE themselves. Thus there is also a clear need for a broadening of the understanding that school principals, and others at the decision-making levels, have of the importance of an environmental education orientation. It is worth stressing, once again, that perhaps of critical importance for effective EE is the school principal's interest and enthusiasm shown for the EE activities and projects undertaken by teachers. It should also be recognised that it is often an office-bound school principal who makes the final decisions with regard to EE projects and activities, especially within the surrounding community. Thus, a very important point that requires consideration is how to equip principals, and often associated bureaucracy, with the skills it needs to manage schools more democratically. This might further involve environmental organisations in the development of courses for the sensitization of decision makers to this need.

As has been stated, there are organisations and centres throughout South Africa, offering similar services to those offered by the *Naturskolan*. Such organisations, non-governmental and otherwise, thus need to form alliances at the local level between schools, community groups, teacher training colleges and local government agencies in order to provide teachers with the

skills, knowledge and commitment that is necessary to involve children with the larger community of adults in solving environmental problems.

The 'larger community' it must be borne in mind, includes people from other parts of the world, a fact that was stressed on a number of occasions during the course of interviews. International links via electronic mail and the internet are becoming increasingly possible and may, in the near future, prove to be very important sources of ideas and inspiration not only for South African EE practitioners but also for learners themselves, a fact that was well illustrated in many of the schools visited during the course of this research.

Future Research

The environmentally literate teacher has been described as a 'priority of priorities' (UNESCO - UNEP, 1990, as cited in Mansaray, Ajiboye, Audu, 1998), because the knowledge, attitudes and skills which she or he imparts not only educates future leaders, but also filters to the adult population (Okpala, 1996, as cited in Mansaray et al, 1998). Gaps or misconceptions that exist in a teachers' knowledge are thus likely to be transmitted as well. And, as commendable as South Africa's efforts may have been with regard to enhancing the environmental competence of her young citizens through the formal education sector, gaps in the knowledge and attitudes of teachers have to be quickly addressed if the new curriculum is to have the desired impact. It has been widely emphasised that one of the major constraints to the implementation of EE in the school curriculum in developing countries is the lack of adequately trained personnel (Sharma and Tan, 1990, as cited in Mansaray et al, 1998). Research into the EE-related knowledge and attitudes of school teachers is thus essential.

One problem, however, with making recommendations for research priorities and school curricula is that the effects of curriculum changes may take many years to become evident (Adedayo and Olawepo, 1997). In order to achieve the goal of integrating EE into the curriculum Adedayo et al (1997) believe that there is a general need for research to be carried out, within the country under focus, centred upon a number of critical topics:

- the status (education, orientation and commitment) of teachers in EE should be measured in order to provide adequate in-service training for them;
- from the standpoint of systemic research and policy intervention, the major problems and support systems that may affect EE in the curriculum must be identified;
- the extent to which teachers integrate EE into their lessons should also be studied.

It must be borne in mind, however, that the vast range of needs and circumstances experienced by South African teachers will, in all likelihood, prevent any attempt to organise research and development on a centralised model, or identify a single solution or environmental educational approach.

7.3 Concluding Remarks

The introduction of the four teaching methods or approaches, upon which this work has focused, into the South African school curriculum will be a fundamental challenge to the past (traditional), yet dominant conception, organisation and transmission of knowledge, creating for most teachers a conflict with their approach to teaching and learning (Esland, 1971, as cited in Palmer, 1998). As has been seen, the fact that EE - the use of the 'environment' as a cross-curricular theme - is strongly encouraged in official educational texts in Sweden, does not necessarily mean that teachers will carry out the quantity or quality of EE that is desired. This is partly because there are a number of fundamental curriculum and pedagogical contradictions between EE, as suggested

here, and traditional schooling (Palmer,1998). In this regard, the goals, principles and guidelines of EE, as expressed by the IUCN, UNEP, UNESCO and the WWF, and as widely acknowledged in South Africa, indicate school-based practices in which learners are involved as individuals, or in groups, in problem-solving, action-based activities. This is in direct contrast to the old South African school curriculum, which was discipline-based and emphasised abstract theoretical problems.

As was indicated on a number of occasions during the course of interviews, the style of learning implicit in the above descriptions of the EE process will often involve elements of difficulty and contradiction. This, in turn, involves teachers in far more complex organisational methods and indeed in taking more 'risks' in relation to maintaining order and control than the style of learning the vast majority of South African teachers are familiar with. As a major criterion in deciding on teaching methods and strategies and in selecting student activities is that they are unlikely to create control problems for the teacher (Stevenson, 1987, as cited in Palmer, 1998) it follows that teachers, perhaps the majority, are unlikely to take readily to the demands of implementing action-oriented, open-ended enquiry into environmental issues. Furthermore, even given the motivation and commitment to take on this challenge, most teachers, as indicated during the interviews, will cite lack of time, resources, support from the principal and colleagues, and pressure to prioritise other things as reasons for not doing so.

In other words, this study supports the literature which suggests that environmental issues are not likely to be the focus of activities or investigations, to any extent, for anyone other than former biology teachers, unless the interest, enthusiasm and motivation of individual teachers and principals so decide. This will obviously not support the successful implementation of internationally accepted guidelines, when teachers already have overburdened timetables because of the need to fulfil statutory requirements.

It must be borne in mind that this study does not, in any sense, supplant the importance of a full, and extensive examination of the perceptions of South African teachers already involved in the use of the environmental theme and the other methods under focus. Nevertheless, it is contended that there are a number of important lessons to be learned from the experiences of teachers in other parts of the world, Sweden in this case, who have been involved in the implementation of a similar educational approach for some time. It is the author's sincere hope that this exercise will inform a more detailed examination of these very crucial issues, within South Africa, in the near future.

As this paper hopes to make clear, there are no blue-prints for success, but the findings so far suggest that the potential lies in the skills, capabilities, ingenuity and local knowledge of teachers, and in the commitment of the many environmental, and other, non-governmental organisations that exist. The challenge is to achieve the common view amongst teachers, principals, parents, and learners themselves, that environmental education is an approach to education that incorporates considerations of the environment, rather than being a separate part of education.

REFERENCES

- Adedayo, A and Olawepo, J. A. (1997) Integration of Environmental Education in Social Science Curricula at the secondary school level in Nigeria: problems and prospects. In *Environmental Education Research*, Vol. 3, No. 1, pp 83 - 95. Abingdon (UK): Carfax Publishing.
- Axelsson, H. (1997) *Dare to Learn: A study of teachers in the context of environmental education*. Gothenburg: Acta Universitatis gothoburgensis.
- Brijker, M., de Jong, R and Swaan, M. (1995) The need for support in secondary schools in the Netherlands in the implementation of environmental education. In *Environmental Education Research*, Vol. 1, No. 1, pp 99 - 107. Abingdon (UK): Carfax Publishing.
- Brundtland, H. (1987) *Our Common Future*. Oxford: Oxford University Press.
- Commoner, B. (1972) *The Closing Circle: confronting the environmental crisis*. London: Jonathon Cape.
- Commonwealth Secretariat. (1991) *Sustainable Development: An Imperative for Environmental Protection*. A Report by a Commonwealth Group of Experts. London: Commonwealth Secretariat.
- Connell, S., Fien, J., Lee, J., Sykes, H and Yenken, D. (1999) 'If it doesn't directly affect you, you don't think about it': A qualitative study of young people's environmental attitudes in two Australian cities. In *Environmental Education Research*, Vol. 5, No. 1, pp 95 - 113. Abingdon (UK): Carfax Publishing.
- Dillon, P. J and Gayford, C. G. (1997) A Psychometric Approach to Investigating the Environmental Beliefs, Intentions and Behaviours of Pre-Service Teachers. In *Environmental Education Research*, Vol. 3, No. 3, pp 283 - 297. Abingdon (UK): Carfax Publishing.
- Ellis, P. (1993) Training for Democracy: Adult Education Practices. In *Convergence*, Vol. 26, No. 1.
- Farrington, J. and Lewis, D. J. (1993) *Non-Governmental Organisations and the State in Asia: Rethinking Roles in Sustainable Agricultural Development*. London: Routledge.
- Hampel, B., Holdsworth, R. and Boldero, J. (1996) The impact of parental work experience and education on environmental knowledge, concern and behaviour among adolescents. In *Environmental Education Research*, Vol. 2, No. 3, pp 287 - 300. Abingdon (UK): Carfax Publishing.
- Hardoy, J. E., Mitlin, D., Satterthwaite, D. (1993) *Environmental Problems in Third World Cities*. London: Earthscan.
- Hart, R. (1997) *Children's Participation: The Theory and Practice of Involving Young Citizens in Community Development and Environmental Care*. London: Earthscan Publications Ltd.
- Hsu, S and Oth, R. E. (1998) An assessment of environmental literacy and analysis of predictors of responsible behaviour held by secondary teachers held in the Hualien area of Taiwan. In *Environmental Education Research*, Vol. 4, No. 3, pp 229 - 250. Abingdon (UK): Carfax Publishing.

- Hutchinson, F. (1997) Our children's futures: are there lessons for environmental educators. In *Environmental Education Research*, Vol. 3, No. 2, pp 189 - 202. Abingdon (UK): Carfax Publishing.
- IUCN. (1980) *The World Conservation Strategy*. Geneva, International Union for Conservation of Nature and Natural Resources, United Nations Environment Programme, World Wildlife Fund (now World Wide Fund for Nature).
- IUCN. (1991) *Caring for the Earth: a Strategy for Sustainable Living*. Geneva, IUCN, UNEP, WWF.
- Jacobs, M. (1994) Towards a Methodological Critique of Sustainable Development. In *The Journal of Developing Areas*, 28, pp. 237-252.
- Jacobsohn, M. (1991) The Crucial Link - Conservation and Development. In *Going Green: People, politics and the environment in South Africa*. Cape Town: Oxford University Press.
- Janse van Rensburg, E., Lotz, H (eds.). (1998) *Enabling Environmental Education as a Cross Curricular Concern in Outcomes-Based Learning Programmes*. Howick (SA): Share-Net.
- Janse van Rensburg, E., O'Donoghue, R. (ed.). (1995). *Environments and Methods*. Howick: Share-Net.
- Jenkin, N and Schudel, I. (1998) *Environmental Education Catalogue: Supporting Outcomes Based Education*. Howick: Share-Net.
- Johnson, D. (1993) Building community capacity for participation in educational governance. In Cole, K (ed), *Sustainable development for a democratic South Africa*. New York: St Martin's press.
- Korten, D. C. (1990) *Getting to the 21st Century: Voluntary Action and the Global Agenda*. West Hartford: Kumarian Press.
- Lele, S. M. (1991) Sustainable Development: a Critique. In *World Development*. No. 19, pp. 607-621.
- Le Roux, K., Lotz, H., O'Donoghue, R. (1998) *School Environmental Policy and Management Plan*. Howick: Share-Net.
- Lotz, H., Tselane, T., Wagiet, R. (1998) *Supporting Curriculum 2005: Developing learning programmes with 'environment' as phase organiser*. Pretoria: Department of Environmental Affairs and Tourism.
- Mansaray, A and Ajiboye, J. O and Audu, U. F. (1998) Environmental knowledge and attitudes of some Nigerian secondary school teachers. In *Environmental Education Research*, Vol. 4, No. 3, pp 329 - 339. Abingdon (UK): Carfax Publishing.
- Mosidi, S. (1997) Enviro Comment. In Lotz, H (ed.), *Enviroteach: A teaching Aid for all Teachers*. Vol. 5, No. 3.
- Ngobese, P and Cock, J. (1995) Development and environment. In Fitzgerald, P., McLennan, A., and Munslow, B. Oxford (eds.) *Managing Sustainable Development in South Africa*. Cape Town: University Press.
- Oscarsson, V. (1996) Pupil's views on the future of Sweden. In *Environmental Education Research*, Vol. 2, No. 3, pp 261 - 277. Abingdon (UK): Carfax Publishing.

- Palmer, J. A. (1998) *Environmental Education in the 21st Century: Theory, Practice, Progress and Promise*. London: Routledge.
- Papadimitriou, V. (1995) Professional development of in-service primary teachers in environmental education: an action research approach. In *Environmental Education Research*, Vol. 1, No. 1, pp 85 - 97. Abingdon (UK): Carfax Publishing.
- Pawlowski, A. (1996) Perceptions of environmental problems by young people in Poland. In *Environmental Education Research*, Vol. 2, No. 3, pp 279 - 285. Abingdon (UK): Carfax Publishing.
- Robertson, C. L and Krugly-Smolka, E. (1997) Gaps between advocated practices and teaching realities in environmental education. In *Environmental Education Research*, Vol. 3, No. 3, pp 311 - 326. Abingdon (UK): Carfax Publishing.
- UNESCO - UNEP (1992) 'UNCED': The Earth Summit', *Connect*, Vol. 17, No. 2, pp 1 - 7.
- Vare, P. (1998) ECoSA: A report on a Pan-African environmental education survey. In *Environmental Education Research*, Vol. 4, No. 1, pp 5 - 24. Abingdon (UK): Carfax Publishing.
- Wals, A. E. J. (1994) Action research and community problem solving: environmental education in an inner city. In *Educational Action Research*, No. 2, pp. 163 - 183.
- Wals, A. E. J and Alblas, A. H. (1997) School-based research and development of EE: a case study. In *Environmental Education Research*, Vol. 3, No. 3, pp 253 - 267. Abingdon (UK): Carfax Publishing.
- Wickenberg, P. (1999) *Norm supporting structures: The environmental theme begins to take root in schools*. Lund, Sweden: Sociologiska Institutionen.
- Wylie, J., Sheehy, N., McGuinness, C and Orchard, G. (1998) Children's thinking about air pollution: a systems theory analysis. In *Environmental Education Research*, Vol. 4, No. 2, pp 117 - 137. Abingdon (UK): Carfax Publishing.
- Yeld, J. (1993) *Caring for the Earth South Africa: A strategy for sustainable living*. Stellenbosch: Southern African Nature Foundation.

Internet Source

Planning your Child's Future: Curriculum 2005 Explained.
<http://www.school.co.za/sage/article5.htm> (02/02/1999). South Africa: Sage Education Trust.

APPENDIX I

Anders Kjellsson
Karin Nilsson
Naturskolan
Lund

Nils Nyberg (SO)
Maud Ejenstam (SO)
Birger Emanuelsson (SO)
Gunneshoskolan
Gunneshovägen 2
222 54 Lund

Siv Gunée (NO),
Gun Romée (Biology and Geography)
Jens Lundahl (NO)
Järnåkraskolan
Mellanvångsvägen 1
223 55 Lund

Anneli Ericsson (NO)
Lilian Jonsson (SO)
Birgitta Nordén (NO)
Tunaskolan.
Warholmsväg 10
224 65 Lund

Suzanne Ekström (NO)
Monica Rosberg (SO and principal)
Nyvångskolan.
Sandbyvägen 18
240 10 Dalby

Birgitta Fal (NO)
Christina Edstedt (NO)
Jan Sörensson (Languages)
Fäladsgården.
Svenshögsvägen 25
226 42 Lund

Daniel Heander (SO)
Eva Sköld (NO)
Fågelskolan
Gässlingavägen 21
227 35 Lund

APPENDIX II

INTERVIEW QUESTIONS

Appendix II: A

Section A: Assessing the Effectiveness of EE within an Integrated Education System

1. How have you assessed/evaluated changes in the environmental knowledge, attitudes, values and habits of each learner? In other words, how has the effectiveness of EE (the use of the environmental theme) been measured. And, how has this changed over time?
2. Looking back over time to the implementation of Lgr 80, what do you feel the factors may have been that made EE more, or less, effective (at generating environmentally sustainable attitudes, values and habits)?

Using the 'Social' Themes

3. To what extent have the 'social themes' (gender equality, alcoholism and drug use, etc.) been used?
4. Are other social issues ever linked to the environmental theme?
5. What impact does a broad-based, integrated educational approach have upon the effectiveness of teaching about alcoholism and drug use, gender equality and other social themes and issues (such as race discrimination, homelessness, and crime)?

Appendix II: B

Section B: Contextualising knowledge through Local Activities and Projects

1. To what extent were/are the school grounds and the local community used as 'outdoor classrooms' for hands-on field study?
2. How has the content of your EE been derived or shaped from investigations of environmental issues in the local community?
3. How important is it, for effective EE, to have local community involvement? And, what has this involved?
4. When working in the community on local projects of what importance is it to have broad, integrated subject areas, rather than separate subjects?

Appendix II: C

Section C: Providing Opportunities for Student Participation in a Democratic Society

1. Have the children had any role in choosing environmental projects in the local environment?
2. How important is classroom democracy, i.e. providing the children with opportunities to participate in directing/influencing EE lesson content and activities?
3. Do you believe that group work has beneficial effects upon the attitudes and values of children, with regards to tolerance and a willingness to co-operate and work with others, (as is necessary during project planning and decision-making within a democratic society)?
4. What are the negative aspects (possible and actual) of group work, for both the teacher and the children?
5. How is it possible to increase the positive impact that group work has upon children's values and attitudes?

Appendix II: D

Section D: Teacher Support, and Other Factors, Influencing the Effectiveness of EE

1. What has been the most important role of 'Environmental organisations', such as the Naturskolan? And, how has this changed over time?
2. What inservice training (INSET) would be useful?
3. What has limited your use of the environmental theme?
4. What do you feel prevents your colleagues from making greater use of the environmental theme?
5. To what extent would you say the effectiveness of EE depends on the motivation and commitment of the teacher, and on the support of the principal, your colleagues, pupil's parents?
6. What impact do the 'teaching teams' (and 'working units') have on the effectiveness with which teachers carry out EE? And, how could the impact of these teams be strengthened?
7. What changes would you like to see in order to make the environmental theme more user-friendly, i.e. to improve EE?