Investigating the incorporation of education *about, in/through* and *for* the environment in the Geography Junior Phase curriculum:

A case study of three Namibian schools

Half thesis submitted in partial fulfillment of the requirements for the degree of **Masters of Education (Environmental Education)**

Of

Rhodes University

Education Department

Supervisor: Ingrid Schudel

By: Eveline Omagano Anyolo

Student no: 609A5013

APRIL 2011

ABSTRACT

This study was carried out to investigate how education *about, in/through* and *for* the environment is incorporated in the Namibian Geography Junior Phase curriculum in three schools in Oshana Education Region. Education *about, in/through* and *for* the environment are three forms of environmental education identified by Fien (1998). This study is a qualitative, interpretive case study. It reviews the activities, content knowledge, methods, competencies and resources and describes how they were used by teachers in fostering education *about, in/through* and *for* the environment in the curriculum. Data was generated through document analysis, observations and semi-structured interviews.

The results were interpreted and discussed in relation to the research question which is: **How is education *about, in/through* and *for* the environment incorporated in the Geography Junior Phase curriculum?** Key findings of the study suggested that teachers incorporated education *about, in/through* and *for* the environment in their teaching. Teachers used the prescribed syllabus to structure their environmental learning lessons. Most methods, resources and activities used by the teachers promoted education *about* the environment. The study also found that most types of knowledge about the environment were covered by the teachers. This enabled learners to examine the complexity and interrelatedness of natural systems.

The study found that the way the resources were used exclusively supported education *about* the environment. Linking learning to local context in this study encouraged education *in/through* the environment and enhanced the learning process through real life experience. The study also found that, although teachers taught their learners *for* the environment, they did not empower them in taking actions towards environmental problems. Based on the insights offered by this research, the study identified further support required by teachers and made recommendations for effective incorporation of *about, in/through* and *for* the environment in the curriculum.

ACKNOWLEDGEMENTS

I would first and foremost like to thank the Heavenly Father for giving me the wisdom to undertake this study. I would also like to thank my supervisor, Ingrid Schudel, for the invaluable support rendered to me during this study. Her critical comments have inspired and shaped this study in many ways. She has been a generous supervisor in this research as well as in many aspects of my work and professional development.

Thanks are also extended to Rob, Lausanne and Heila for their encouragement and support in completion of this study. Thanks to all members of the Environmental Education Unit at Rhodes University who provided me with the necessities which made this study a success. I would further like to thank my fellow participants for finding the time to share their thoughts and ideas with me.

I would like to thank the management of Ongwediva College of Education (OCE) for allowing me to take time off from work to attend the Masters of Education sessions at Rhodes University in South Africa (SA). I am grateful to the SADC REEP (SADC Regional Environmental Education Program) for the financial support that made it possible for me to participate in this course. I am also grateful to my sister Maria Anyolo and my brother Hambelela Anyolo for financial assistance which enabled me to travel to Rhodes University.

Special thanks go to my friend Modestus Mwiila for the comradeship and support we shared over the years, and for the valuable support rendered to me during the development of this thesis. Special thanks also go to my sister Josephine Jekonia, my colleague Caroline Mbango and my friend Lineekela Hamunyela for giving me hope when things were tough at the beginning of this research.

Finally, I would like to acknowledge all of the teachers who participated in this case study for providing me with valuable information which has made this study a success. I learnt so much from them and I am most grateful for their contributions to this research.

TABLE OF CONTENTS

CHAPTER 5:

DISCUSSION OF FINDINGS

LIST OF TABLES

LIST OF APPENDICES

LIST OF ABBREVIATIONS

Recognized abbreviations

AIDS	ACQUIRED IMMUNE DEFICIENCY SYDROME
AT	ADVISORY TEACHERS
BED	BACHELOR OF EDUCATION
BETD	BASIC EDUCATION TEACHERS DIPLOMA
C.A.P.E.	CAPE ACTION FOR PEOPLE AND THE ENVIRONMENT
CFCs	CHLOROFLUOROCARBONS
DRFN	DESERT RESEACH FOUNDATION OF NAMIBIA
EE	ENVIRONMENTAL EDUCATION

EEASA	ENVIRONMENTAL EDUCATION ASSOCIATION OF SOUTHERN AFRICA
ESD	EDUCATION FOR SUSTAINABLE DEVELOPMENT
ET	ENVIROTEACH
HIV	HUMAN IMMUNE VIRUS
IUCN	INTERNATIONAL UNION FOR THE CONSERVATION OF NATURE
MET	MINISTRY OF ENVIRONMENT AND TOURISM
MOE	MINISTRY OF EDUCATION
NAEE	NATIONAL ASSOCIATION FOR ENVIRONMENTAL EDUCATION
NEEN	NAMIBIA ENVIRONMENTAL EDUCATION NETWORK
NGO	NON GOVERNMENTAL ORGANISATION
NIED	NATIONAL INSTITUTE FOR EDUCATIONAL DEVELOPMENT
OCE	ONGWEDIVA COLLEGE OF EDUCATION
SA	SOUTH AFRICA
SADC REEP	SOUTHERN AFRICA DEVELOPMENT COMMUNITY'S REGIONAL ENVIRONMENTAL EDUCATION PROGRAM
UN	UNITED NATIONS
UNCED	UNITED NATIONS CONFERENCE ON ENVIRONMENT AND DEVELOPMENT
UNEP	UNITED NATIONS ENVIRONMENT PROGRAM
UNESCO	UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANISATION

WCED	WORLD COMMISSION ON ENVIRONMENT AND DEVELOPMENT
WCED	WORLD COMMISSION OF ENVIRONMENT AND DEVELOPMENT

Abbreviations used in this study to refer to the data sources

AM	ANALYTICAL MEMO
I	INTERVIEWS
LO	LESSON OBSERVATIONS
LP	LESSON PLANS
S	SYLLABUS
S1	SCHOOL ONE
S2	SCHOOL TWO
S3	SCHOOL THREE
T	TEACHER
TB	TEXTBOOKS

CHAPTER 1: INTRODUCTION AND BACKGROUND TO THE STUDY

1.1 BACKGROUND TO THE STUDY

The Namibian Government acknowledged that environmental education is one of the essential tools for empowering individuals and communities to take meaningful actions and positively shape the future of their own environment and themselves (Ministry of Education, 1995). Environmental education (EE) refers to organized efforts to teach about how natural environments function and particularly, how human beings can manage their behaviour and ecosystems in order to live sustainably (Ministry of Education, 2005). Environmental education is primarily concerned with providing learners with knowledge, skills, values and attitudes necessary for studying the relationship between people and the environments in order to identify environmental issues and problems.

To enable Namibians to move from environmental awareness to understanding and actions, the Namibian Government aimed to provide all Namibians with access to environmental education, whether at formal or non-formal level. After Namibian independence in 1990, environmental education became part of the Namibian school curriculum. This was guided by the Namibian Constitution (Ministry of Education, 1990) as well as policy statements in "*Towards education for all*" (Ministry of Education, 1993).

Environmental learning according to the Ministry of Education (2005) is all about understanding *about* the environment, developing sensitivities and skills *in/through* the environment and fostering values and attitudes that commit us to acting *for* the environment. The Namibia's environmental education policy document states that:

> Environmental learning programmes should aim to empower Namibians from all sectors to critically evaluate environmental information and options, to make informed decisions and to take actions that will contribute to the goal of environmental and economic sustainability (Ministry of Education, 2005:10).

This study pays attention to learning *about, in/through* and *for* the environment, as described by Fien (1998), in the teaching of the Namibian Geography Junior Phase curriculum.

1.2 RESEARCH INTEREST

The research focus for this study arose within my previous role as a Geography teacher as well as my current position as a teacher educator. I worked as a Geography teacher for the Senior Secondary Phase (Grade 11-12) for 8 years. During this time, I noted that Geography teachers had a problem in planning and presenting environmental learning in the curriculum. However, an environmental learning focus in Geography is important as it provides opportunities for the child to explore, investigate and develop an understanding of the natural dimensions of local and wider environments.

In my current position, I am working with a Junior Phase Curriculum in training Junior Phase student teachers in the field of Social Sciences. Through this, I noticed that Geography teachers can play a significant role in the process of overcoming environmental problems. It is in this light that I developed an interest in exploring the relationship between the Junior Phase Geography Curriculum and environmental learning in schools. This study attempts to look into how Junior Phase Geography teachers incorporate education *about, in/through* and *for* the environment. Teaching methods, resources and activities used by the teachers in fostering environmental focus in the curriculum will be investigated.

It is hoped that this research will give insight into what and how contents, methods and resources are used by teachers in fostering environmental learning in the Geography curriculum. The research may be useful to inform current and future Geography teachers on the effective teaching methods and use of resources in teaching environmental learning.

This research aims to explore the relationship between the Junior Phase Geography Curriculum and environmental learning through answering the question: How is education *about, in/through* and *for* the environment incorporated in the Namibian Junior Phase Geography Curriculum?

Fien (1998) describes three forms of environmental education. The first form is education *about* the environment. This element inculcates knowledge and understanding. The second element is education *in/through* the environment. This element develops environmentally related actions and skills. In this regard, students should be given opportunities to see, touch and feel the object being taught to ensure they are involved. The third form is education *for* the environment. This inculcates the attitudes and values for the conservation of the environment.

The research goals are to:

- establish teacher perspectives on context, rationale and intentions in lesson planning and implementation
- describe methods, activities and resources in the syllabus, textbooks and lesson plans
- describe how methods, activities and resources are implemented in the classroom context
- suggest how the above mentioned aspects of curriculum influence education *about, in/through* and *for* the environment

1.3. CONTEXT OF THE STUDY

In Namibia, environmental concern mostly started around 1990, when the country got its independence. Problems such as pollution, deforestation and desertification are experienced in Namibia as a result of new developments and a growing population (Ministry of Education, 2005).

In response to these environmental crises, Namibia needed to create an environmentally literate nation which could understand the nature of the environment and how it functioned and take the necessary action to live sustainably (Ministry of Education, 2005). Therefore, the Namibian government embarked upon educational reform, which was seen as a vehicle to bring environmental education to the school curriculum.

Environmental education, according to the Namibian environmental policy is:

> the process of developing environmentally literate citizens who are aware and concerned about the total environment and are empowered through knowledge,

> attitudes, motivation, commitment, skills and shared decision making to individually and collectively achieve an improved quality of life through the sustainable use of and appropriate development of Namibia's resources (Ministry of Environment and Tourism, 2004:3).

The Namibian government, in its policies and documents of the new education system, incorporated environmental education as a cross curricular theme, as environmental issues cut across all subjects. This means that teachers of all subjects, at all levels need to incorporate environmental issues in their teaching. These issues include social interactions, natural and cultural factors, agricultural practices, health and sustainable development. To understand the environmental issues, we need to identify, link and use environmental issues in planning themes and issues for teaching and learning (Ministry of Education, 2007).

The reform was also seen as a shift from Teacher Centred Education to Learner Centred Education. According to the Namibian education policy, "*Towards Education for All*", the previous educational system in Namibia was about teaching the elite in a positivistic system that was based on apartheid and racism.

The new education system is built on a Learner Centred Education and is aimed at harnessing curiosity and excitement and promoting democracy and responsibility in lifelong learning (Ministry of Education, 1993). According to the Ministry of Education (2007), Learner Centred Education is defined as education in which teaching and learning are based on student's experiential development and scholastic background, interests, goals, hopes, attitudes and learning needs.

1.4. A BRIEF OVERVIEW OF THE CHAPTERS

Chapter 1 gives an overview of the study as well as my interest in doing this study. It outlines the broader context of the study. The chapter also briefly provides some insights into my role as a teacher educator.

Chapter 2 provides a general overview of literature relevant to the topic that was investigated. Much of the literature is drawn from the work of Fien (1993), Palmer (1998) and Neap and Palmer (1994) to shed light on the significance of education *about, in/through* and *for* the environment, which is the focus of this research. The chapter puts the study in context by providing a history of Namibian education reform, a gateway for environmental education in Namibia.

Chapter 3 describes the research design of the study. The chapter also presents the methodological framework that guided this research. This chapter further describes the methods used to generate and analyze data. It introduces the codes and categories used in the process of data analysis. It also clarifies how and why an interpretive case study was used and explains how validity, trustworthiness and ethics were dealt with in this study.

Chapter 4 is a presentation of data. The chapter is organized into four headings which present what participants perceive about the incorporation of education *about, in/through* and *for* the environment in the curriculum.

Chapter 5 is a discussion of the research findings presented in Chapter 4, in relation to the literature review in Chapter 2. Data was condensed into analytical statements, which attempt to answer the research question.

Chapter 6 presents a summary of findings of the research process. The chapter also presents recommendations that suggest how education *about, in/through* and *for* the environment can be effectively incorporated in the curriculum, more especially the Junior Phase Geography curriculum.

CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

This chapter presents an overview of the three forms of environmental education (education *about, in/through* and *for* the environment) as outlined by Fien (1993). First, the chapter discusses education reform in Namibia. This section explains how environmental education was brought into the Namibian education system.

Secondly, the chapter looks at education *about, in/through* and *for* the environment and how international understandings of environmental education resonate with these. The chapter looks at the international understanding of environmental education and resonates it with education *about, in/through* and *for* the environment. It further locates education *about, in/through* and *for* the environment in key historical events of environmental education.

The chapter discusses the policies and documents which influenced environmental education in Namibia in relation to education *about, in/through* and *for* the environment. It locates the study in the context of the Namibian education system, which underwent a major education reform after the country's independence in 1990. The education reform included the revision of the school curriculum. Changes in the school curriculum included the incorporation of environmental education as a cross curricular theme (Ministry of Education, 1993).

The chapter also locates education *about, in/through* and *for* the environment in the Namibian school curriculum and Namibian Geography Junior Phase curriculum. Finally, the chapter discusses the approaches to teaching and learning of environmental education in relation to education *about, in/through* and *for* the environment.

2.2 EDUCATION REFORM IN NAMIBIA

This section gives a brief description of education reform in Namibia. Two primary aims of education reform (quality and democracy) are explained in relation to education *about, in/through* and *for* the environment.

When Namibia emerged as an independent nation in 1990, it embarked upon a major reform of the education system (Ministry of Education, 1993). Namibian education reform was first guided by policy statements in *"Towards Education for All"* (Ministry of Education, 1993). According to this document, "education for all does not mean increasing the number of learners in schools; it means that there is a need to replace the philosophy and practice of education suitable for educating an elite with a new philosophy and practice that will cater for educating all citizens of Namibia irrespective of their colour and race" (Ministry of Education, 1993:4). The new philosophy and practice is based on education for all.

According to the Ministry of Education (1993) the desires of the people of Namibia, before the country gained its independence, were to provide education that is accessible, efficient and of good quality: life-long learning and democratic participation in all spheres of education. The primary aims for this reform were identified as access, equity, quality and democracy in education. In the following section, I will argue how environmental education can contribute specifically to two of these aims - quality and democracy.

Quality means that the relevance, meaningfulness and reasonableness of challenge in education are fore grounded. Environmental education includes learning, both in school and outside of school and thus helps learners to address real and meaningful issues in their surrounding environment.

Environmental education was seen by the Namibian Government as education that brings students, teachers and communities together through programs that allow students opportunities to interact and learn with adults within the school environment. This improves the quality of education as individuals in their communities can take meaningful actions and positively shape the future of their own environment and themselves (Ministry of Education, 1995).

Hale (1993) explained that environmental education is about improving the quality of experience of the whole curriculum. This means that environmental education is incorporated in all school subjects as a means of enhancing quality in education. This was supported by Bornman (1997) who asserted that through the curriculum of school subjects the aims, goals and objectives of environmental education could also be achieved.

The Brundtland Report (1987) defined Sustainable Development as meeting the needs of the present without compromising the ability of the future generations to meet their own needs. These needs can then be described as economic, social (cultural and health) as well as political. Sustainable development safeguards the needs of future generations by minimizing the use or waste of non-renewable resources; sustainable use of renewable resources and ensuring that the waste from cities is in keeping with the absorptive capacity of local and global sinks (Global Forum, 1994).

In support of this concept of sustainable development lies the concept of Education for Sustainable Development (ESD) which has been defined by Fien (1993:93) as follows:

> The development of human capacity and creativity to participate in determining the future, encourage technical progress as well as foster the cultural conditions favouring social and economic change to improve the quality of life and more equitable economic growth while living within the carrying capacity of supporting ecosystems to maintain life indefinitely.

UNESCO (2009) confirmed that ESD is setting a new direction for education and learning for all. It seeks to promote quality education, and is inclusive of all people. It is based on values, principles and practices necessary to respond effectively to current and future challenges.

The United Nations Educational, Scientific and Cultural Organization (UNESCO) World Conference (2009) called for action on ESD promoted ESD's contribution to all of education and to achieving quality education. This includes promoting the role and contribution of the media for fostering public awareness and understanding of sustainability issues (UNESCO, 2009).

The second aim that plays a major role in environmental education is democracy. Democracy means that education should be democratically structured, democracy should be taught and experienced, and the aim should be to protect a democratic society like Namibia (Ministry of Education, 1993). The Namibian Ministry of Education (1993) stated that a democratic education system is organized around broad participation in decision making. This, they envisaged, could be achieved as learners make informed decisions about their environment and act towards their environment in a democratic way (Ministry of Education, 2005).

According to Bones (1994:15) "today's students are tomorrow's leaders and decision makers; they need to learn and practice the skills necessary to protect, preserve and restore the environment". With environmental education in the curriculum, we can use the slogan of "thinking globally and acting locally". Through acting responsibly at a local level students are supported to make informed decisions and move towards a democratic way of resolving environmental issues and problems.

In Namibia, environmental education is based on a Learner Centred Approach and "represents a democratic style of teaching" (democratic pedagogy) (Ministry of Education, 1993:8). The Namibian Policy, "*Towards Education for All*" maintains that for democracy to be practiced, teachers must be active creators and managers of the learning environment and not its masters or caretakers. According to the Ministry of Education (1998), democratic pedagogy is a methodology which promotes learning through understanding, and practice directed towards empowerment to shape the conditions of one's own life.

Learner Centred Education is an approach to teaching and learning that comes directly from the national goals of equity and democracy. It is an approach that means that teachers put the needs of learners at the centre of what they do in the classroom (Ministry of Education, 1999). The document also identifies learning as an active process with participation from the learners in developing, organizing, implementing and managing learning (Ministry of Education, 1993).
The idea of democracy resonates with education *for* the environment which was described as the practice of just, participatory and collaborative decision making involving a critical analysis of the development of the nature forms and the formative process of society generally and of a

power relationship within a particular society (Fien and Gough, 1996: 214). In the following section education *for* the environment as well as education *about* and *in/through* the environment will be discussed in some detail.

2. 3 WHAT IS EDUCATION *ABOUT, IN/THROUGH* AND *FOR* THE ENVIRONMENT?

This section describes three forms of environmental education (education *about, in/through* and *for* the environment), as identified by Fien (1993).

Environmental education is defined by the International Union for the Conservation of Nature (IUCN) in Palmer & Neal (1990:2) as:

> the process of recognizing values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the inter-relatedness among man, his culture and his biophysical surroundings. It also entails practice in decision making and self formulation of a code of behaviour about issues concerning environmental quality.

This definition resonates with Fien's interest in assisting learners to understand the relationships between people and their surroundings, appreciate and use their environments as classrooms for learning and develop their concerns for the environment (Fien, 1993).

According to Fien (1993), the first form of environmental education is education *about* the environment. This form emphasizes knowledge about natural systems and processes and the ecological factors that influence decisions about how people use the environment. The importance of knowledge is emphasized by the belief by some educators that many environmental problems are a direct result of sheer ignorance or lack of understanding (Murdoch, 1993; Palmer 1998).

Martin (in Martin and Wheeler, 1997:24) explained that "education *about* the environment [centres] around the acquisition of knowledge and understanding about the environment". He argued that the acquisition of knowledge and understanding about the environment will enable

pupils not only to hold a store of relevant concepts, facts and figures; but also to critically evaluate issues and situations in the light of informed understanding (Palmer, 1998).

Fien (1993:15) points out that "knowledge of the interaction between natural systems and social systems is an essential requirement for resolving local, national and global environmental issues and for managing the environment responsibly". In this case, the environment provides the learning situation in which a range of skills can be developed to achieve desired knowledge.

Successful teaching will involve learners in learning *about* their environment and they will develop knowledge and understanding of:

- the natural processes which take place in the environment
- how life is dependent on the environment
- the impacts of human activities on the environment
- how the present environment has been affected by past actions and decisions
- the importance of effective action to protect the environment

(Palmer & Neal, 1994:135-136)

Education *about* the environment is the most common form of environmental education as knowledge about environmental education "develops learner's understanding of changing social formation and their use of nature" (Blight, Soutter, Sibly & Smith, 1990:123). This will develop in learners an understanding of how the transformation of nature allows social development, how human environments are socially constructed and how social relations shape environmental relations.

Murdoch (1993) believed that the second form of environmental education, education *in/through* the environment, can be the most powerful way to learn about and appreciate the way the natural world works. It is a pedagogical technique that uses the environment as a resource for learning. It does this to add reality, reference and practical exercise to learning and to provide students with an appreciation of the environment through direct contact with it (Fien, 1993). The environment is a resource which enables the development of a greater deal of knowledge and understanding as well as skills in investigation and communication. The aim of this pedagogical technique is to

increase environmental awareness through experience in mostly natural settings. Fien (1993:17) suggested that "such activities in the environment tend to be learner centred and may include such skills as observation, photographs and using scientific instruments".

With this pedagogical approach, students can develop and use skills through direct experience in the environment. Direct experience, investigation and problem solving in the environment enable reflection and the development of critical awareness and concern. Palmer (1998:44) maintained that "working in the environment leads to the acquisition of a greater deal of knowledge and understanding as a result of first hand experiences, as well as to the refinement of skills such as those needed for investigation and problem solving".

Education *through* the environment may also foster environmental concerns if learners become captivated by the importance and fragility of ecosystems and the beauty of landscape, or immersed in the values conflict over an environmental issue (Fien, 1993).

Successful teaching will involve learners in learning *through* the environment when:

- using relevant first-hand resources and real life experiences as a basis for learning
- working outside the classroom as a natural extension of the working environment
- developing skills of enquiry and exploration within the local area and contrasting environments elsewhere
- developing communication skills such as reporting the results of research

(Palmer & Neal, 1994:136)

The third form of environmental education is education *for* the environment. Huckle (1998:197) stated that:

> Education *for* the environment is a combination of radical environmentalism and education which regards environmental well-being as its goal. The curriculum is designed to increase pupils' awareness of the moral and political decisions shaping their environment and give them the knowledge, attitudes and skills which will help them form their own judgments and to participate in environmental politics. Such objectives are realized through issues-based projects

in the immediate environment, which seek to cultivate awareness and understanding and culminate in some forms of community actions.

Similarly, Murdoch (1993) maintained that education *for* the environment encourages children to reflect on their learning and to develop the skills to act on what they have learned. It affirms the relationship we all have with the environment and is grounded in real life, active experience. It teaches children to use problem solving and decision making skills to help bring about a change.

Education *for* the environment requires teaching strategies consistent with its goals (Fien, 1993). The Belgrade and Tbilisi international agreements (UNESCO-UNEP, 1978) encourage teachers to use a wide range of teaching and learning techniques emphasizing practical activities and first hand experience.

Education *for* the environment investigates environmental problems with the intention of resolving them. Palmer and Neal (1994) pointed out that education *for* the environment encourages pupils to explore their personal responses to and relationships with the environment and environmental issues. This is linked to the development of attitudes and values, including elements of human understanding and behaviour necessary for the development of sustainable and caring use of the environment. This experience develops in learners an informed concern for the environment and teaches them skills that will help participation in environmental politics.

Fien (1993) indicated that education *for* the environment engages students in the exploration and resolution of environmental issues in order to promote lifestyles that are compatible with the suitable and equitable use of resources. This is supported by Fien & Gough (1996) who stated that education for the environment aims to promote a willingness and ability to the lifestyles that focus on students working individually and in groups towards the resolution of environmental questions, issues and problems. In doing so, it builds on education *about* and *through* the environment to help develop an informed concern for the environment, a sensitive environmental ethic, and the skills for participating in environmental protection and improvement.

Successful teaching will involve learners in being educated *for* the environment when they:

- develop an interest in and learn to appreciate their environment through the care of living things and their habitats in and around the school
- develop a respect and liking for their environments through relevant and interesting studies of it
- seek solutions to environmental problems within the school and the local area, taking account of conflicting interests

(Palmer & Neal 1994:136)

According to Gayfold (1991), these three forms should not be seen as mutually exclusive but they are clearly interrelated. However, different emphases have often been placed on each of the forms, depending on the teaching context.

Blight, Sautter, Sibly & Smith (1990) emphasized that each of these approaches can encourage students to respond actively if the teacher believes this to be the objective. However, Palmer (1994) believed that, in the hands of experienced and committed teacher educators, education *for* the environment will be the most effective way to help students become empowered and participate actively to build a better environment for all. Fien & Gough (1996) cautioned that education *about* and *in/through* the environment are only helpful if they provide the skills and knowledge to support education *for* the environment.

2.4 HOW DO INTERNATIONAL UNDERSTANDINGS OF ENVIRONMENTAL EDUCATION RESONATE WITH *ABOUT, IN/THROUGH* AND *FOR* THE ENVIRONMENT?

This section describes the relationship between international understandings of environmental education and education *about, in/through* and *for* the environment.

Internationally, environmental education was regarded as a holistic approach that developed awareness raising, acquired new perspectives, values, knowledge and skills and behaviour change in support of a sustainable environment (Wood, 2003). Jickling and Wals (2008)

contradict Woods (2003)'s idea that sustainable development is an appropriate aim for environmental education depending on how education is conceptualized. While sustainable development is a social construct that warrants education, it may not be so important that it should be elevated to the status of privileged doctrine (Jickling & Wals, 2008).

The aims of environmental education were put forward by UNESCO as follows:
Awareness: To help all people to acquire an awareness of and sensitivity to the whole environment and its problems.
Understanding: To help all people gain first-hand experience and a basic understanding of environmental process and issues.
Attitudes and values: To help all people acquire values of concern and responsibility for the environment, and the motivation to actively participate in efforts to take care for it.
Skills: To help all people to acquire the skills to play their part in identifying and solving environmental problems (including skills of judgment, cooperation and conflict resolution).
Participation: To provide all people with an opportunity to work towards the resolution of environmental problems.

The above aims resonate with education *about, in/through* and *for* the environment as follows: The first aim resonates with education *about* the environment as it makes people aware of their environment. The second aim resonates with education *in/through* the environment as it provides basic understanding about the environment through first hand experience. The third, fourth and fifth aims resonate with education *for* the environment. In this regard, people develop a concern about the environment, empowered through skills and attitudes needed to understand how humans relate to their physical surroundings and work towards solving environmental problems.

Palmer (1998) sees environmental education as an organized effort to teach how natural environments function and, particularly, how human beings can manage their ecosystems in order to live sustainably. This idea resonates with the concept of education *about* the environment as it makes people aware of how natural environments work. The idea also resonates with education for the environment as it increases public awareness and understanding about sustainable development and ESD (Bonn Declaration, 2009). ESD was launched by the

report of the World Commission on Environment and Development (WCED) 1987, *Our Common Future*. It was propelled forward by the 1991 World Conference on Environment and Development in Rio de Janeiro, and was the focus of attention again of the World Summit on Sustainable Development at Johannesburg in 2002. Through this period, concerted efforts have been made to transform environmental education into ESD (Jickling & Walls, 2008).

In formal education, the teaching of environmental education resonates with the principles of the Tbilisi Declaration (Enviroteach, 1995:15). The teaching of environmental education makes people aware of the human-environment interaction which is vital in facilitating informed decision making. These principles are (among others):

- consider the environment in totality
- examine major environmental issues
- focus on current and future environmental situations
- explicitly consider environmental aspects in plans for development and growth
- help learners to discover the symptoms and real causes of environmental problems
- emphasise the complexity of environmental problems
- learn and teach about the environment using different learning situations and a variety of educational approaches

These principles resonate with education *about* and *for* the environment. The Tbilisi Declaration emphasized that environmental education is a learning process that increases people's knowledge and awareness *about* the environment and associated challenges, develops the necessary skills and expertise to address the challenges; and fosters attitudes, motivation and takes responsible action (UNESCO, 1978). In the same sentiment, it ensures opportunities for every person "to acquire the knowledge, values, attitudes, commitment and skills of the individual, groups and society as a whole towards the environment" (Gandhi, 2007). These principles also enable learners to explore their personal response to and relationship with the environment and environmental issues.

This can be related to education *about* and *for* the environment as it stimulates people's development of awareness, understanding and skills in relation to sustainability and maximizes both human being and ecological integrity throughout social engagement and action (Scott, 2009).

The Tbilisi Declaration (1998) addresses the concepts of education *about, in/through* and *for* the environment as it aims to educate people on how the natural ecosystems work, make them aware of the environmental issues, promote interaction with the environment (using the environments as a resource) and encourage them to make informed decisions in solving environmental problems.

The Tbilisi Declaration was seen as a way of fostering awareness of and concern about the environment and environmental issues. It provided people with opportunities to acquire the knowledge, values, attitudes; commitment and skills needed to promote and improve the environment and create new patterns of behaviour of individuals and society as a whole towards the environment. Using aspects of the natural environment as a teaching resource can be seen as education *in/through* the environment (UNESCO Tbilisi Declaration, 1997).

This notion is supported by Fien's (1993) ideas about environmental education which can be resonated with education *for* the environment as it seeks to develop an active and informed citizenry committed to the values and practices of ecological and social sustainability.

2.5 LOCATING *ABOUT, IN/THROUGH* AND *FOR* ENVIRONMENT IN KEY HISTORICAL EVENTS

In this section, I am going to locate education *about, in/through* and *for* the environment in key historical events which responded to environmental issues and started to conceptualize environmental education at an international level.

The 1960s were characterized by increased environmental awareness and concerns about the ability to deal with environmental problems in the world. As a result, a number of

intergovernmental conferences were organized internationally by powerful groups, such as the United Nations, in response to the growing awareness about a rapidly declining global environment (Janse van Rensberg, 1996).

Among these conferences was the United Nations Conference on the Human Environment which was held in Stockholm in 1972. This conference led to an international workshop for environmental education which was held in Belgrade in 1975. It was realized by many governments in the world that the protection and improvement of the environment were major issues throughout the world. This interest in educating people about the protection of their own environments resonates with education *about* the environment which influences people to make decisions about the use of their environment. The understanding also resonates with that of Gandhi (2007) that education should promote general awareness of the causes and effects of environmental problems.

Several of these international conferences influenced the thinking on environmental education in southern Africa. One such conference was the Tbilisi which was held at Tbilisi (USSR) in 1977. Organized by UNESCO the conference was attended by 66 member states. According to Irwin (2007), the Tbilisi declaration provided a framework and guidelines for the practice of environmental education southern Africa.

Another international reports which influenced the thinking of environmental education in southern Africa was the the World Commission on Environment and Development (entitled Our Common Future or the Brundtland Report). As stated earlier, the main theme in the report is the notion of sustainable development. According to UNESCO/UNEP (1987), this document shaped the introduction of environmental education in Namibia. As a result of this report, many workshops were held, culminating into the implementation of many environmental projects in the country.

The commission's definition of sustainable development, that is, "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (UNCED, 1992), resonates with education *for* the environment in a way that it calls for a

sustainable living. Sustainable living includes elements of understanding the development of sustainable development and use of the environment.

The Forum Principles of the Non-Governmental Organization (NGO) and Chapter 36 of Agenda 21 are other important documents which resonate with the concept of education *for* the environment. The two documents aim to make people aware of the goals of sustainability, and "support them to enact sustainability measures and move towards a more sustainable society" (Fien 1993: 93). Sustainability allows students/people to learn about the environment and its functioning. This helps them to develop an understanding and appreciation for human-environment relationships.

However, Jickling and Spork (1998) argued that students who examine ideologies which underlie human-environment relationships engage in cultural criticism and reconstruction and might find sufficient ground to reject "red-green". The red-green is what Fien believed to be a "best possible" ideology. He made this desired "red-green" future the objective of his educative effort by placing it at the heart of education *for* the environment.

Therefore, Jickling (1992) criticized education *for* sustainable development. According to him, it is not clear what sustainable development is aiming for. Jickling (1992:8) notes that:

> having argued that we should not educate *for* sustainable development, it is quite a different matter to teach students about this concept. I would like my children to know about the arguments that support it and attempt to clarify it. But, I would also like them to know that sustainable development is being criticized, and I want them to be able to evaluate that criticism and participation in it if they perceive a need. I want them to realize that there is a debate going on between a variety of stances, between adherents of an egocentric worldwide and those who adhere to an anthropocentric worldwide. I want my children to be able to participate intelligently in that debate. To do so, they will need to be taught that those various positions also constitute logical arguments of greater or less merit, and they will need to be taught to use philosophical techniques to aid their understanding and evaluation of them.

Nevertheless, sustainable development with its call for a more sustainable society still raises questions about how to develop human capacity to work towards a more equitable and

sustainable future. This is one of the SADC REEP's ESD practices whereby it involves people in sustainable development and working with values and ethics concerns (Lotz-Sisitka, 2006). In a similar manner, the Ahmedabad Declaration (2005:27) also viewed "ESD as a shift from viewing education as a delivery mechanism, to the recognition that we are all learners as well as educators".

The above account shows that international environmental education discourse implicitly and explicitly reflects elements of education *about, in/through* and *for* the environment as described by Fien (1993).

2.6 POLICIES INFORMING ENVIRONMENTAL EDUCATION IN NAMIBIA AND THEIR RELATION TO EDUCATION *ABOUT, IN/THROUGH* AND *FOR* THE ENVIRONMENT

This section describes the policies and documents which influenced the development of environmental education in Namibia. These policies are described in relation to education *about, in/through* and *for* the environment.

The international commissions and reports such as, The NGO Forum Principles and Agenda 21, the 1990 Report of the South commission, the Brandt Commission Report, the Global 2000 Report and World Commission on Environment and Development, which influenced the thinking of environmental education in southern Africa were disseminated in Environmental Education Association of Southern Africa (EEASA) and had influence in the development of national policies of several countries such as Namibia in southern Africa. The dissemination of the commissions and reports in EEASA led to the organization of several workshops/conferences on the development of environmental education in many southern African countries. The 1991 Conference/Workshop in Windhoek for example saw the establishment of NEEN which affiliated with EEASA (Irwin, 2007).

As already stated, environmental education was not fully integrated into the Namibian curriculum before independence. When Namibia gained independence in 1990, the Namibian

government embarked upon a major reform of the education system, which was guided by the policy document "*Towards Education for All*" (Ministry of Education, 1993). According to this document, "education for all does not mean increasing the number of learners in schools; it means that there is a need to replace the philosophy and practice of education suitable for educating an elite with a new philosophy and practice that will cater for educating all citizens of Namibia irrespective of their colour and race" (Ministry of Education, 1993:4).

The new philosophy and practice is based on education for all. UNESCO (2010) in Lotz-Sisitka (2010) indicated that the most recent Education for All Global Monitoring Report discusses the importance of education that reaches the marginalized. Lotz-Sisitka (2010) added that the report also discusses the importance of education and makes the important point that education enables children to have access to a wider range of life choices and chances, and confirms the relationship between education and development. She further indicated that failure to retain children in school expands the chances of their exclusion and their marginalization. This has implications for a country's ability to develop sustainability.

Education reform was seen by the Namibian government as a vehicle for bringing environmental education into the curriculum. To implement education for all, the Ministry of Education developed a programme of Basic Education which aimed to, among others; develop literacy, numeracy and understanding of the natural and social environment. According to the Ministry of Education (1990), the promotion of environmental learning among children and adults is important for Namibia's development and environmental sustainability.

Fien's concern with education for change (see Section 2.2) is mirrored in the government's prioritization of environmental education in order to increase awareness of environmental risks and problems and encourage communities to manage their local environment in a sustainable manner (Ministry of Education, 2001).

The most important change influencing environmental education in Namibia started with the drafting of the Namibian Constitution for an independent Republic of Namibia. Article 95 of the Namibian Constitution emphasized that:

> the state shall actively promote and maintain the welfare of the people by adopting, inter alia, policies aimed at ... maintenance of the ecosystem, essential ecological process and biological diversity of Namibia and utilization of living natural resources on a sustainable basis for the benefit of all Namibians both present and future, the government should provide measures against the dumping and recycling of foreign nuclear and toxic waste on Namibia territory.
>
> (Ministry of Education, 1990:198)

The establishment of NEEN has been a milestone in the history of environmental education in Namibia as it facilitated information sharing in environmental education. The NEEN policy (1999) statement maintains that:

> Namibia will actively encourage, support and implement environmental education as a means of achieving and fulfilling Article 92 of the constitution. Environmental education should aim to empower Namibians, from all sectors, to critically evaluate environmental information and options, to make informed decisions and to take actions that will contribute to the goals of environment and economic sustainability (NEEN, 1999:79).

Evidence of education *about, in/through* and *for* the environment can be seen in these quotes as they encourage learning about the environment. They also increase the students' awareness of particular environments by providing direct contact with the environment and promote sustainable relations among people and their environments (Fien, 1993).

Similarly, the *Pilot Curriculum Guide for Formal Basic Education* sets its aims to encourage and foster environmental learning in the Namibian curriculum. Its aims for:

- holistic understandings of the dynamic interdependence of all living things and their environment;
- a sense of responsibility toward restoring and maintaining ecological balances through the sustainable management of natural resources;
- an involvement in practical activities to preserve and sustain the natural environment through a learner cantered methodology that promotes learning through understanding

continuous assessment of the learning process and introduces practices that reflect and reinforce both the value practice of democracy; and

- laying a foundation for informed and responsible attitudes and choices towards the balance of population growth, ecological sustainability, and the quality of life for all Namibians (Ministry of Education, 1996:6)

The aims above have elements of education *about, in/through* and *for* the environment. The first aim can be related to education *about* the environment as it enables people to gain knowledge and understanding of the environment. The second aim can resonate with the concept of education *for* the environment as it sets a foundation for people to make decisions and take actions towards solving environmental problems within their own environments. This understanding of the Ministry of Education has similarities with Palmer and Neal (1994) as they believe that education *for* the environment enables people to explore the relationship between their environment and environmental issues, which leads to the development of attitudes and values. The third aim can be related to education *in/through* the environment as it involves practical activities where the environment can be used as a resource. This emphasis on these educational policies has led to the incorporation of environmental learning in the Namibian curriculum. The fourth aim resonates with education *for* the environment in the sense that it makes people more responsible for sustainable living.

The formulation of the *Green Plan* by the Namibian government in 1992 was the first attempt to initiate processes and actions that would link environmental issues and development. The *Green Plan* demonstrated the commitment of the government of Namibia to the protection and improvement of the environment. The document sets out key issues and strategies for ensuring health, sustainable renewable natural resources, protecting bio-diversity and economy, and contributing to global environmental security (Ministry of Education, 2005).

With the *Green Plan*, the Namibian government aims to enable Namibians to move from environmental awareness to understanding and action. The promotion and support of structured and continued environmental awareness raising initiatives aims at developing informed citizens to be able to critically engage in decision making and action taking for sustainable development

(Tveitdal, 2005). The *Green Plan's* call for 'action' indicates a need for education 'for' the environment with its emphasis on bringing about change in the environment (see Section 2.3).

2.7 EDUCATION *ABOUT, IN/THROUGH* AND *FOR* THE ENVIRONMENT IN THE NAMIBIAN CURRICULUM

In this section, I am going to discuss how education *about, in/through* and *for* the environment is reflected in the Namibian curriculum.

In the *Curriculum Guidelines for Environmental Learning in Namibia,* environmental education is said to be about learning how to make our world a better place in which to live, learn, work and play without reducing the opportunities or resources for others to do this in the future (Namibia: Ministry of Education, 2005). Palmer (1998) maintains that such learning will link with the development of attitudes and values, including elements of, and reflections on, human understanding and behaviour necessary for the development of sustainable living patterns within the carrying capacity of the planet and its resources. These explanations have elements of education *for* the environment as they empower students for action and call for sustainable living. Elements of education *about* the environment can also be seen in these explanations as they promote knowledge and understanding of things in the environment.

The Namibian Ministry of Education sees an integration of education *about, in/through* and *for* the environment in the curriculum as important. This is evident in their description of education *about, in/through* and *for* the environment as a process that produces students with opportunities to learn about the functioning of natural systems, to identify their beliefs and opinions, consider a range of views and ultimately make informed and responsible choices about their future and that of the environment (Ministry of Education, 2005). Teachers are also encouraged to use the direct environment as a teaching resource. This provides learners with direct experiences as they learn on site.

In view of the Tbilisi Declaration principles (see Section 2.4), the school curriculum will be developed to educate people *about, in/through* and *for* the environment. This is evident by the

fact that these principles will enable learners to acquire knowledge *about* the environment and develop in them critical thinking and problem solving skills. The incorporation of education *about, in/through* and *for* the environment in the curriculum is important as it leads to the acquisition of skills necessary for the maintenance and improvement of the environment, enabling learners to learn on site and develop the confident to act *for* the environment.

Learner Centred Education policy in Namibia holds implications for environmental education. It aims to develop in learners a sound knowledge base with understanding so that learners can make sense of environmental issues (Ministry of Education, 2005). This understanding resonates with education *about* the environment as it creates learning opportunities which will enable learners to explore and understand how different systems function and make sense of environmental issues.

The Ministry of Education acknowledged the importance of mobilizing the prior-knowledge of learners and provides opportunities for the construction of meaning in context, which is guided by the Pilot Curriculum Guide for Formal Education's vision of environmental education within learner centred focus. It implies that Learner Centred Education presupposes that the teacher has a holistic view of the learner, valuing the learner's life experience as the starting point for their lessons. Content as well as methods used should be selected based on learners' needs and local and natural resources should be used to supplement ready-made study materials.

The learner in the Learner Centred Education is an active participant in the teaching and learning process and is exposed to a more practice based inquiry. According to the *Curriculum Guide for Senior Secondary Education,* the learner brings a wealth of knowledge and social experience gained from the interaction with the environment. Evidence of education *in/through* the environment can be seen in this explanation as it indicates an emphasis on learning in context. This resonates with the Ministry of Education (2005), which emphasizes learners learning whether in school grounds, their immediate environment or going further on a field trip, which gives them a wide range of skills to identify and explore the environmental issues.
The learner centred approach also aims to enable learners to critically analyze and act upon solving environmental issues in and outside the school ground. This resonates with education *for*

the environment as it enables learners to solve environmental problems. Evidence of education *for* the environment can also be seen in the Ministry of Education's (2005:12) interest in "developing informed concerns about and encouraging a safe use of the environments now, and in the future". The focus is on sustainable solutions to environmental problems taking into account the range of conflicting interests and different perspectives that inform the choices available to us (Ministry of Education, 2005).

This section has argued that environmental education is based on the principles and practices of Learner Centred Education. This indicates an emphasis on a learner centred approach to education which is about learners sharing and interpreting information with others. In Learner Centred Education, the teacher is required to get learners involved in the teaching and learning process. This explanation has similarities with education *about, in/through* and *for* the environment as it views the learner as someone who brings a wide range of environmental knowledge to the classroom and constructs new knowledge (education *about* the environment), creates opportunities whereby learners explore and find out things themselves to enable them to develop a range of skills (education *in/through* the environment), and who becomes involved in action taking in response to environmental issues (education *for* the environment).

2.8 LEARNING *ABOUT, IN/THROUGH* AND *FOR* THE ENVIRONMENT IN THE NAMIBIAN JUNIOR PHASE GEOGRAPHY CURRICULUM

This section explains how education *about, in/through* and *for* the environment is reflected in the Namibian Junior Phase curriculum.

The Namibian Geography Junior Phase syllabus defined Geography as a study of the earth, and the interaction between humans and nature. It is about the ways in which humans have adapted nature to meet their needs and requirements, and to what extent humans are able to utilize their environment in a sustainable manner (Ministry of Education, 2006).

Geography is regarded by the Ministry of Education (1998) as a vehicle for the delivery of environmental education because it brings together the natural and social world. Tilbury and

Williams (1997) emphasized that Geographical content and methodology have a great deal to contribute to environmental education. Geography, which studies the interaction between humans and their physical environment, contributes to an understanding of the process affecting the environment and encourages an interest in its management and protection (Ministry of Education, 2007).

This explanation provides evidence of education *about* and *for* the environment as it a) makes people aware of what affects their environment, and b) develops an interest in managing the environment. Most significantly, environmental problems have a spatial dimension which makes a geographical understanding crucial to environmental education (Tilbury & Williams, 1997). This can be linked to education *in/through* the environment as it calls for direct contact with the environment.

It is through Geography that learners get to know their physical, social and political world, first close to their homes and then more widely, using inquiry and the interpretation of skills and content from Geography. Rosenburg (2009:14) pointed out that "learners will be able to demonstrate geographical and environmental knowledge and understanding to make informed decisions about social and environmental issues and problems". This idea can be resonated with education for the environment as it enables learners to come up with wise decisions for solving environmental problems.

From what has been stated above, education *about, in/through* and *for* the environment are parts of Geography. It is through Geography that learners could accumulate valuable knowledge *about* their environment, use and appreciate their environments *through* fieldwork activities and develop attitudes which maintain a sustainable living. This is supported by Gayfold (1991) who said that it is through Geography that learners learn *about* the interrelationships between learners and the environment.

Evidence of education *in/through* the environment can also be seen in Gayfold's (1991) statement that Geography also provides opportunities for learners to learn *in/through* the

environment. In this case, the environment is used as a familiar and relevant resource for education purposes.

Geography enables learners to explore their personal response to and relationship with the environment and environmental issues (Gayfold, 1991). Tilbury and Williams (1997) maintain that this helps to build, in learners, not only critical understanding of environmental issues but also commitment and values, as well as skills. This indicates education *for* the environment as it treats students as thinking people who have the right to make choices and express opinions.

The place of education *about, in/through and for* the environment in the South African and Namibian Geography curriculum is explored below. I am drawing from the South Africa curriculum in cases where it differs from the Namibian curriculum.

The Namibian Geography curriculum calls for an examination of humans in their interdependent relationship with the environment. It aims to develop an understanding of the relationships and interactions of people and their environment in response to physical and human processes as well as aspects of a changing world (Ministry of Education, 2006). This resonates with education *about* the environment as it enables people to interact with the environment in responding to environmental problems.

The Namibian Geography curriculum also emphasizes first-hand experience. It suggests that learners should be taken out in the environment to experience the issues discussed in the classroom (Ministry of Education, 2006). Evidence of education *in/through* the environment is seen in this explanation as it enables learners to use the environment as a resource for learning as recommended by Fien (1993), for the better understanding of the content.

The Namibian Geography curriculum should also prepare learners to be able to operate effectively in their society and the environment as responsible members of their communities (Ministry of Education, 2006). This enables learners to act responsibly in response to environmental problems. In a similar sentiment the South African curriculum aims to prepare informed and responsible citizens and decision makers who can challenge social and

environmental injustice (C.A.P.E, n.d). This has similarities with education *for* the environment as it promotes learners with the skills and motivation to act for the environment and prepare them for the sustainable use of the environment. In this regard, there were similarities with environmental education in southern Africa.

The Namibian Geography syllabus has specific themes and topics, which offer the potential for all three dimensions of environmental education (*about*, *in/through* and *for* the environment). These topics provide opportunities to explore the inter-relationships between people, their values and attitudes and the environment and the manner in which considerations of sustainable development influence decisions concerning the planning and management of environments and resources. This provides people with knowledge about the environment and promotes personal development.

The Ministry of Education identified learning objectives for the Geography Junior phase: These objectives are as follows:

- be introduced to the equatorial rainforests, the tropical savannah and the tropical desert
- be introduced to human activities and their effects on the natural environment in Namibia
- understand the different forms of economic activities
- understand the importance of the sustainability of natural resources
- be introduced to social and environmental problems experienced in local settlements
- know the different types of production such as subsistence, commercial and home craft
- investigate the reasons for the deterioration of the environment and search for possible solutions
- develop an understanding of agriculture in Namibia
- develop an understanding of fishing in Namibia

(Ministry of Education, 2007:13-45)

These objectives make very clear what information needs to be covered 'about' the environment. The implied competencies can be interpreted in a variety of ways. For example, a number of the objectives require learners to be 'introduced' to various topics. A teacher could choose to

introduce topics by giving a lecture 'about' the topic or by taking the learners 'into' an appropriate environment or by involving learners in a sustainability practice 'for' the environment. Similarly the learners could be helped to 'understand' topics in a variety of ways. It is the aim of this research to investigate the different ways in which teachers are interpreting and working with these objectives.

2.9 APPROACHES TO TEACHING AND LEARNING (ABOUT, IN/THROUGH AND FOR THE ENVIRONMENT)

This section looks at a number of approaches to environmental education as discussed by Palmer (1998). These approaches can be related to education *about, in/though* and *for* the environment as follows:

1) Problem solving approach – An approach that instructs students to examine specific environmental problems. It is an approach by which students set out problems to guide their studies (Palmer, 1998). Students need to investigate a problem, understand it and make appropriate decisions in response to environmental problems. For example, learners could find out 'about' the environmental problems associated with different waste management choices. They could then investigate waste disposal issues 'in' their own community and draw up a waste management plan 'for' improving the situation. The aim of the approach is to help students consolidate learned associated knowledge (Palmer and Neal, 1994).

2) Experimental approach – An approach that enables specific opportunities for students to operate environmental experiments under controllable conditions in order to gain direct experience. During experiments, students can observe and understand the origins of some environmental problems, discover some factors influencing them and arrive at some solutions based upon experiments (Palmer and Neal, 1994). For example, students could investigate the wastage of water 'in' the school or at home by investigating ways in which water is wasted, designing methods to measure how water is wasted, considering ways to save water or use water sustainably and considering the benefits of saving water. The aim of the approach is to help students gain perceptual knowledge and material by themselves, so that they understand new

environmental knowledge better (Palmer, 1998). This enables learners to accumulate new knowledge, experiences and insight through doing.

3) Field study approach – This approach emphasizes the value of education *in/through the* environment as it allows students to go outside to observe such problems as environmental pollution, exhaustion of natural resources, and destruction of the ecological environment (Palmer, 1998). This enables learners to draw comparisons between what is learned in class and what happened in the local environment. The approach aims to involve learners in research work and develop their observation skills. What is learned will be utilized and incorporated into their experiences in order to gain new insights relating to their study.

4) Simulated approach – With this approach, teachers create certain scenes and ask students to take the role of the necessary characters in them, that is a role play situation (Palmer, 1998). For example, the teacher can take learners to an area where deforestation has taken place and ask them to think of what influenced/caused the area to be the way it is and of solutions to this environmental problem. The aim of the approach is to help students learn to think broadly of various factors that influence the occurrence of environmental issues from the environmental values and attitudes.

2.10 CONCLUSION

This chapter has related trends in environmental education to the Namibian Junior Phase Geography curriculum. The chapter first addressed education reform in Namibia. It then made a distinctive difference between education *about, in/through* and *for* the environment.

The chapter further illustrated several intergovernmental conferences such as United Nations (UN) Conference on Human Environment, Belgrade Workshop, Tbilisi Conference, World Commission on Environment and Development, Rio Summit and EEASA Conference) which were organized by the UN in response to the growing awareness about a rapid declining global environment (Janse van Rensberg, 1996).

These conferences promoted education *about, in/through* and *for* the environment as they aimed to foster public concern about the environmental issues. This enabled people to acquire skills to investigate environmental issues and solve problems; and influenced people to make informed decisions about the use of the environment.

The chapter also explained how environmental education became part of the Namibian curriculum, with the view to developing knowledge and skills, and values and attitudes for a better quality of environments. In this section, efforts to incorporate environmental education in the Namibian curriculum from a historical perspective have been presented.

Learning *about, in/through* and *for* the environment in the Namibian curriculum and the Junior Phase Geography curriculum is also explained in this chapter. The chapter illustrated that Geography was seen as contributing to the understanding of education *about, in/through* and *for* the environment. Through Geography, learners gain knowledge and develop understanding of their surrounding environment and that of others. Geography also enables them to acquire an onsite experience of the environment as they use it as a resource for learning. It also prepares them to become responsible future citizens and decision makers.

Finally, the chapter has discussed different approaches to environmental education such as problem solving, experiments, field trips and simulation.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter describes the research methodology and approaches employed in this study for collecting information with regard to the research question: How is education *about, in/through* and *for* the environment incorporated in the Namibian Junior Phase Geography curriculum?

First, the chapter describes the research orientation. This section explains why a case study methodology with an interpretive approach to research was chosen.

Secondly, the chapter looks at the instruments used to generate data in this study. Document analysis (Geography syllabus and textbooks) was first conducted. Then, document analysis of teachers' lesson plans and non-participant observations of these same lessons were conducted. These observations were informed by the syllabus and textbooks analysed. Interviews which were informed by the lesson observations were also conducted.

The chapter also provides an overview of how the data generated through the three methods mentioned earlier were analyzed. This section provides the categories and sub-categories for document analysis, observations and interviews conducted in this study.

Finally, the chapter also discusses how validity and ethics were dealt with in this study.

3.2 RESEARCH METHODOLOGY

This study is a qualitative, interpretive case study. According to Burton, Brundrett and Jones (2000), a case study needs to concentrate on generating deeper and detailed knowledge of a well defined context or phenomenon. Yin (2003:2) maintains that "a case study allows an investigator to retain the holistic and meaningful characteristics of real life events". Janse van Rensburg (2001) indicated that interpretive researchers are interested in the meaning that people make of phenomena. Applying an interpretive methodology in this study indicates that the interest of this

research is in contextual meaning-making, rather than generalized rules. Cantrell (1993:83) stated that "an interpretive orientation aims to understand and interpret daily occurrence and social structure as well as the meaning people give to phenomena". She further said that, an "interpretive paradigm allows a researcher to understand the situation of the chosen phenomena and to interpret meaning within the social and cultural context of the natural settings" (Cantrell, 1993: 84). In the same vein, Connole (1998) pointed out that the interpretive perspective places primary emphasis on the process of understanding the situation in which the research is being done.

Using an interpretive methodology in this study helped me to identify opportunities for education *about, in/through* and *for* the environment in the Geography curriculum and understand how teachers make meaning of this through their lesson plans and classroom interactions.

3.3 DATA GENERATION

In this case study, a variety of data generation methods were used to ensure that adequate and valid data was collected. The data generated was triangulated in a process described by Mertens (1998:183) as "checking information that has been collected from different sources or methods for consistency of evidence across sources of data".

In this light, three data generation methods were used to collect data for this study.

- Document analysis
- Observations
- Interviews

These methods are discussed in detail below.

I visited the schools three times. For ethical consideration, the names of the schools have been withheld. The purpose of the first visits were to meet and inform the school principal and the teachers concerned about my project and to obtain the Geography materials I needed to analyze. The materials included the Geography textbooks and syllabi for Grades 8, 9 and 10. The second visits were to make arrangements for observations and interviews with the concerned teachers.

The third visits were to do the observations and conduct interviews. The teachers were chosen based on the subject and the phase they were teaching. All Junior Phase Geography teachers were selected. In some schools, the teachers were teaching more than one grade, for example Grades 8 and 9 at S2 were taught by one teacher. It is therefore, the number of teachers selected varied from school to school.

Teachers 1 (T1) and 2 (T2) teach at one school 1 (S1). Teacher 3 (T3) teaches at the second school 2 (S2) and T4, T5 and T6 teach at a third school 3 (S3). T2 and T3 were observed twice as they teach Grades 9 and 10, so they were observed in both grades 9 and 10 respectively.

Three schools were selected in the region. These schools were chosen based on their performance. S1 was regarded as an average performing school, S2 was regarded as a poor performing school and S3 was regarded as a high performing school. Although I planned to do three observations in each school, this was not possible as T3 (at S2) was not available in the school during the observation time.

3.3.1 Document Analysis

In this study, document analysis formed the bulk of the data generation process. Yin (2003:85) indicated that "documentary information is likely to be relevant to every case study" it can take many forms and should be the object of explicit data collection plans. Yin (1994:80) stated that "documentation is a stable source that can be reviewed repeatedly". Documents can provide first and original information on the topic being studied (Du Preez, 2007). Documents analyzed include Geography textbooks for Grades 8, 9 and 10, syllabi for Grades 8, 9 and 10, and lesson plans in teachers' preparation books. Learners' work was part of my original proposed document analysis; however, I did not get any marked learners' work from the teachers. 'According to the teachers, there was not enough time to mark learners' work as they were busy setting April examination'.

Table 1 records the Geography textbooks that were used.

Table 1: Geography textbooks used

Grade	Authors	Year	Title	Place of Publication	Publisher
8	Oherein, D., Douglas, R., Baas, A., Morrison, K. & Dilley, I.	2007	Geography in context	Namibia	Longman
9	Douglas, R. Feltn, S. Van Rhyn, T. Morrison, K. & Baas, A.	2007	Geography in context	Namibia	Longman
10	Nethling, B.	2008	Geography in context	Namibia	Longman

First, selected parts of Geography textbooks (one book per grade) and Geography syllabi for Grades 8, 9 and 10 were analyzed. Only sections in these documents relevant to the lessons observed were analyzed. The relevant sections included the topic under discussion as well as the introductory section of the textbook.

Second, the teachers' lesson plans were analyzed. Eight lesson plans were analysed (1 lesson per grade), except for S2 where one teacher was not available. This analysis was done in comparison with the syllabus and the textbook. The analysis was done to see how teachers use the syllabus and the textbooks in planning their lessons. The analysis provided me with deeper insight to frame interviews which were used to get teachers' perspectives on context, rationale and intention in lesson planning. It also made me aware of how teachers interpret the environmental focus in the Geography curriculum.

In reporting and analysis, the data was represented by the following symbols: LP, S, and TB.

3.3.2 Observations

Observation can be "one of the most powerful tools in research especially for researchers in social sciences" (Burton, Brundrett & Jones, 2000). According to Cantrell (1993), the purpose of observation is to give the researcher direct, firsthand experience with the phenomena under study. In the same vein, Johnson, Patton, Scott, Darr, Petric, Smith & Burter (2004:186) stated that observation is important because "it allows the observer to collect information about people because people do not always do what they say".

This study included/adopted a non-participant observation approach which took place in teachers' classrooms. I was able to observe:

- classroom context (such as size and language use)
- the content, methods, activities and resources used by the teachers
- specific interactions, questions and answers

The observations were also done to inform the interview data. Teachers were observed how they incorporate environmental learning in the curriculum and interviewed about their intentions of doing that. Six teachers were observed as they teach Geography at Junior Phase level and one observation was done per teacher, with the exception of T2 and T3 who were observed twice because they teach both Grades 9 and 10.

Observation schedules/sheets were prepared and used to record observations (see Appendix 1). Observations were also video recorded. An elaborated observation schedule for each lesson observation was drawn up while watching each video recording. This enabled me to pick up specific quotes and record more detail than in the 'on site' observations. The elaborated observation schedules were allocated the symbols as recorded in Table 2 below.

Table 2: Symbols used to identify schools, teachers and observations

School	Teacher	Observation
School 1 (S1)	Teacher 1 (T1) Teacher 2 (T2)	Observation 1 (LO1) Observation 2 and 3 (LO2, LO3)
School 2 (S2)	Teacher 3 (T3)	Observation 4 and 5 (LO4, LO5)
School 3 (S3)	Teacher 4 (T4) Teacher 5 (T5) Teacher 6 (T6)	Observation 5 (LO6) Observation 6 (LO7) Observation 7 (LO8)

3.3.3 Interviews

Interviews are a conversation between two or more people (the interviewer and the interviewee). According to Mweti and Van Wyk (2005), interviews are used to find out information from a particular group of people, or to find out their opinions. They take rather a lot of time but they are very useful because they can find out things that you could not find out easily any other way. As they are quite time consuming for both the interviewer and the interviewee, it is imperative that both sides are fully briefed as to the purpose and the value of the potential evidence from the interviewee (Burton, Brundrett & Jones, 2000). Cohen, Manion and Morrison (2007) indicated that an interview is a flexible tool for data collection.

For this study, semi-structured interviews were conducted with six teachers (T1, T2, T3, T4, T5, and T6) whose lessons were observed. According to McMillan and Schumacher (2006:204), "semi- structured interviews have no choice from which the respondent selects an answer". They are phrased to allow for individual responses. They are open-ended questions, but fairly specific in their intent. They allow the interviewee to provide answers at length and allow the researcher to probe further and follow up. Thus Johnson et al. (2004) maintain that the importance of using an interview in qualitative research is that participants' thoughts, beliefs, knowledge, reasoning,

motivation and feelings are better obtained. Therefore, semi-structure interviews were used to give me an opportunity to follow up on the responses.

Therefore, semi-structured interviews were designed and used to deepen understanding of the observations of the teachers' lessons through further insight into teachers' context, rationale and intentions in lesson planning and presentation of the Geography curriculum.

An interview schedule/guide was prepared and administered (see Appendix 2). Interviews were tape recorded and this was very useful in the transcription and for direct quoting (see Appendix 3). The symbols I1, I2, I3, I4, I5 and I6 were used to represent the interviews.

3.3.4 Summary of methods used for data collection

The following table shows the methods which were used in generating data in this study, as explained above.

Table 3: Summary of methods used for data collection

Methods	Number	Symbol
Document Analysis	4	
• Syllabus (S)	1	S
• Textbook (TB)	3	TB1, TB2, TB3
• Lesson plans (LP)	8	LP
Lesson Observations (LO)	8	LO1, LO2, LO3, LO4, LO5, LO6, LO7, T6LO8
Interviews (I)	6	I1, I2, I3, I4, I5, I6

3.4 DATA ANALYSIS

The data generated from document analysis and lesson observations in this study was analyzed in terms of activities, content knowledge, methods, intended competencies and resources used by

the teacher. The learners' prior knowledge, teacher and learner interaction, link to local context and teachers' teaching style were also analyzed.

The data generated from the interviews were analyzed in terms of the role of Geography in learners' lives, education *about, in/through* and *for* the environment in the lessons taught as well as the methods used by teachers.

The information from document analysis, observations and interviews was colour coded according to these categories. According to Merriam (1998:7), coding is "nothing more than assigning some sort of short hand designation to various aspects of your data so that you can easily retrieve some specific pieces of data".

After colour coding, analytical memos were constructed and information was recorded under categories and sub-categories.

The first analytical memo (AM1 – see Appendix 4) was to analyse the interview. The following categories were used for this process.

- Role of Geography in learners lives
- Importance of teaching learners *about* the environment
- Availability of information used to teach *about* the environment
- Importance of teaching learners *in/through* the environment
- Importance of linking the lessons to local context
- Curriculum support on linking lessons to local context
- Importance of teaching learners *for* the environment
- Importance of involving learners in action taking towards environmental problems
- Teaching methods used in presenting lessons

The second analytical memo (AM2 – see Appendix 5) did a comparison analysis between the syllabus, textbooks and classroom implementation for the topics covered by the teachers. This comparison was done in terms of the following categories:

- Lesson content presented by teachers

- Activities used by the teachers
- Content knowledge
- Learners' prior knowledge
- Intended learner competencies
- Resources used by the teachers
- Link to local context
- Teaching style

3.5 VALIDITY AND TRUSTWORTHINESS

In order to ensure validity and trustworthiness, multiple sources of information were used to enable me to have triangulated data. Cohen, Manion and Morrison (2007) defined triangulation of data as the use of at least two appropriate methods to check on the same information. This was done through document analysis, observations and interviews in this study. The decision to use three methods of data collection proved very fruitful because the methods complimented one another in the sense that depth of understanding that could not be adequately achieved by one method, could be by another. For example, the observation method could not uncover the teacher's perspectives on context, rationale and intentions in their lesson plans and the implementation thereof. Semi-structured interviews were used to gain this alternative perspective.

A member checking strategy was also used. I took back all the interview data to the participants for verification. The interview transcription was given to each school that participated, particularly for the teachers interviewed to read through. The selected data from transcriptions of the video recorded during observations were made available to the teachers.

3.6 RESEARCH ETHICS AND VALUES

Ethics is defined as a set of widely accepted moral principles that offer/provide rules for, and set behavioural expectations of the most correct conduct towards experimental subjects or respondents, other researchers, assistants and students (Strydom, 2002).

In line with the government requirements for conducting research in Namibia and to ensure that ethical issues are attended to in this study, the researcher wrote a letter to the Ministry of Education to request permission to conduct research at three schools in Oshana Education Region (see Appendix 6). I obtained approval from the Ministry of Education through the Permanent Secretary (see Appendix 7) and from the Education Region (see Appendix 8) to conduct research in the three schools in Oshana Education Region. A letter was written to all teachers involved, informing them about the nature of the research, their freedom to participate or decline to participate and that they may withdraw from the research at any time (see Appendix 9). I also produced a consent letter to the concerned teachers for the use of photographs and a video camera during the observation and a tape recorder during the interviews (see Appendix 10 and 11). These consent letters were signed by all teachers that participated in this study and were kept in the file.

I made it clear that the consent of participants was voluntary, without any implied deprivation or penalty for refusal to participate and with regard to participants' privacy and dignity. The participants were informed that all information obtained about them was to be treated confidentially.

3.7 CONCLUSION

In this chapter, I have described the research methodology and methods used to collect the information needed to answer my research question. A mixture of methods, namely document analysis, classroom observation and interviews were used to triangulate the data. The way the methods were used and the symbols used to represent the data were also covered.

I also described how analytical memos were constructed through the development of categories and sub-categories. Finally, I provided a discussion on how validity and trustworthiness were dealt with and explained how I considered ethical issues in the research. In the next chapter, I present the findings from document analysis, observations and interviews.

CHAPTER 4: DATA PRESENTATION

4.1 INTRODUCTION

This chapter gives a report on the findings about the incorporation of education *about, in/through* and *for* the environment in the Namibian Geography Junior Phase curriculum. These findings are derived from an analysis of documents, observations and interviews.

The chapter begins by presenting a description of the three schools where the research was conducted (the school context) and the participating teachers' backgrounds. It then presents the teachers' intentionality and experiences with respect to education *about, in/through* and *for* the environment. The chapter also considers the curriculum and curriculum implementation, where all lessons observed are described and analyzed in relation to the research question.

4.2 THE SCHOOL CONTEXT AND TEACHERS' BACKGROUND

This section gives a brief description of the three schools that participated in this study. The section also looks at the background of the teachers involved in this study.

4.2.1 The first school

The school is a Junior Secondary school, which caters for Grades 8 to10. It is situated on the outskirts of Ongwediva town in the Oshana Education Region. Regionally, it is regarded as one of the average performing schools since the independence of Namibia (Ministry of Education, 2009). It is a school where most of the teachers are from the town and the children from the surrounding rural and urban areas. It has electricity, tapped water, and flush toilets for both teachers and learners. Classrooms are inadequate. There is not enough furniture, light or ventilation and the floors are dirty. The school serves a poor socio-economic community. Learners whose parents cannot afford to buy uniforms do not wear uniforms; instead, they wear what their parents can afford.

Two Geography teachers were observed in the school. T1 teaches Geography to Grades 8 learners and has a BEd (Bachelor of Education) degree. Her class consists of 36 learners. T2 teaches Grades 9 and 10 and has a BETD (Basic Education Teachers Diploma). His Grade 9 class consists of 29 learners and Grade 10 consists of 41 learners.

4.2.2 The second school

The second school is a Junior Secondary School, which caters for Grades 8 to 10. It is situated in Oshakati Town in the Oshana Education Region. It is about 6 kilometres away from the heart of the town. The school is regarded as one of the poor performing schools since the 1990s (Ministry of Education, 2009) and currently accommodates 580 learners, mostly from urban areas. There are 30 teachers in the school. The school has electricity in all rooms, a photocopying machine and a computer for the secretary. The school has tapped water and flush toilets for both teachers and learners.

One Geography teacher was observed in the school (T3). The teacher teaches Geography to Grades 8 and 9. She has a BETD. Her Grade 8 class consists of 36 learners, while her Grade 9 class consists of 30 learners.

4.2.3 The third school

The third school is a Senior Secondary School, which caters for Grades 8 to 10. It is situated in Ongwediva Town in the Oshana Education Region. It has been regarded as one of the best schools in the region since independence. The school accommodates learners from urban areas. It is an urban school equipped with electricity in all the rooms. It has a library which is used by both teachers and learners. The school also has a photocopying machine, computer laboratory, tapped water and flush toilets for both teachers and learners.

Three Geography teachers (T4, T5 and T6) were observed in the school. T6 teaches Geography to Grade 8 and has a BEd degree. His class consists of 42 learners. T4 teaches Geography to Grade 9 and also has a BEd degree. Her class consists of 40 learners. T5 teaches Geography to Grade 10 and has also a BEd degree. Her class consists of 43 learners.

4.3 TEACHERS' INTENTIONALITY AND EXPERIENCES OF ENVIRONMENTAL LEARNING

All six teachers were interviewed about their intentions and experiences with the lessons taught. The following emerged from the interviews.

4.3.1. Environmental education training

Teachers involved in this study were asked whether they had attended any training/workshops on environmental education. All teachers interviewed indicated that they had not attended any workshops or training in environmental education (AM2). However, they acknowledged that environmental education was part of Geography and Geography played a role in learners' lives. T1 noted that Geography "unlocks learners to the reality of the world they live in" (I2. pg. 2). T2 noted that "Geography enables learners to take care of the environment and sustain it for the future generations" (I1. pg. 1). T4 indicated that Geography was multi-disciplinary subject. It was a combination of subjects such as Economics, Agriculture, Life Science and Biology. She noted that "Geography enables learners to apply the content to other subjects" (I3. pg. 18). T6 indicated that he had attended workshops related to environmental education but not exactly on environmental education. He also acknowledged that Geography was important in learner's lives. He noted that "Geography enables learners to interact with the environment" (I6. pg 18).

4.3.2 Education *about* the environment

Even though teachers had not attended any training in environmental education, they were able to identify environmental issues in Geography, which are relevant to learners' lives (see AM2). They indicated that these issues are relevant in learners' lives because they affect their everyday lives. TI indicated that global warming was relevant because it affects the whole world in which these learners live. She noted that "it changes the environment in which learners live" (I2. pg. 5). T3 indicated that issues such as air, land and water pollution played a major role in learner's lives because they affect them in many different ways. She noted that "if land, water and air are polluted, it will be unhygienic to the learners and this will affect their whole future" (I3. pg. 9).

Teachers experienced challenges in teaching environmental learning in Geography. When interviewed, T1 indicated a lack of visual materials and a concern that textbooks do not provide enough information to teach *about* the environment.

Most of the teachers indicated that they wanted their learners to know *about* the environment. When interviewed, they all noted that it was very important for learners to first know *about* the environment in which they lived and that of others (see AM2). T1 noted "I wanted my learners to know about the diversity of the environment that exist[s] in the world" (I2. pg. 6). T1 further said that "my learners only know about the tropical savannah and tropical deserts which exist in Namibia" (I2. pg. 6). T3 noted "I wanted my learners to know *about* their environments, the importance of their environments in which they live better". T2, T3, T5 and T6 indicated that it is very important to teach learners *about* the environment, so that learners could preserve, conserve and sustain the environment.

All teachers, except T6, indicated that they had enough information to cover the topics taught. However, they wanted to explore more about these topics. They explained that where textbooks were available, most of the information was drawn from there. T1 indicated that, apart from the textbook, she also used other books in planning her lesson. She noted "yes I had enough information because I used three different books" (I2. pg. 6). T5 also noted "well there was enough information to plan the lesson" (I5. pg. 10), however, she wanted to explore more about the topic. T5 noted "pollution is an endless entity; I want to explore more on finding out where other countries stand" (I4. pg. 5). T6 was not sure whether the information was enough or not. He noted "I can say more or less, yes, but it was not quite enough because of lack of resources such as textbooks, where one can get information" (I6. pg. 23).

Most teachers in this study indicated that the curriculum supports the importance of linking lessons to local context (see AM2). They acknowledged that the curriculum included topics on environmental issues in both Namibia and the world. Things like erosion, deforestation and desertification were in the curriculum, which provides the opportunity to accommodate local issues. T3 noted that "the curriculum included environmental issues both in Namibia and the world" (I5. pg. 11). T4 noted that "the syllabus included local projects and field trips in its

content" (I3. pg. 20). However, one teacher (T5) presented a contrasting opinion that "the curriculum did not support such opportunities; it was up to the teacher to find ways on how learners can learn better" (I6. pg. 24).

4.3.3 Education *in/through* the environment

T2 and T3 taught their learners *through* the environment, where they took their learners outside and used the environment as a resource (see LO3 and LO4 in AM1). These teachers took learners to different places in the local/school environment for different reasons. For example, T2 took learners outside to see the area where bush encroachment happened and discuss how it happened. T2 noted "I took my learners outside the classroom to the environment (bushy area) because I realize that theory without practice is nothing, learners learn more when they see things" (I1. pg. 3). T3 took her learners out to observe the natural and man-made vegetation within the school environment. She noted "I took them outside the classroom to see different trees and plants because I wanted them to link what they were taught in the class with what they can see outside" (I5. pg. 11).

When interviewed, all teachers felt that it was very important to take learners outside the classrooms into the field and use the environment as a resource. They stressed that this can be done through field trips to enable learners to focus more.

They further indicated that in doing so learners understood the content better. T4 felt that a learner needed to be taught and be involved in the lesson to practice what he/she was taught. She further noted the saying "teach me and I forget, show me and I remember, involve me and I understand" (I3. pg. 19).

Teachers argued that there was a need for teaching learners using the environment as a resource for learning so that learners can relate what they learn to what is happening in reality since they seemed to separate reality from their own learning. They further argued that learners needed to be exposed to different environments.

Teachers indicated that, before learners learnt about environmental issues of the country, it was vital that they know about their local environmental issues. T3 noted that "if learners learn how deforestation takes place in their own environment, they will be able to relate to that when taught deforestation of the other places in the world" (I2. pg. 7). T4, T5 and T6 indicated that it was very important to link to local context and the local community where learners live because this is what learners know and see every day. T1 noted that the importance of linking the lesson to local context was "learners become aware of reality that surrounds them" (I1. pg. 7).

However, some teachers indicated that they experienced constraints in using opportunities such as taking learners out for field-trips. Time was the major constraint experienced (see AM2). T2, T3 and T5 indicated that there was not enough time to explore and link all lessons to local context. T5 noted that "taking learners for a day trip will affect other subjects" (I4. pg. 24).

Most of the teachers involved in this study indicated that the curriculum supported the importance of taking learners for field trips. They indicated that the curriculum included environmental issues in both Namibia and the World. T6 noted that the curriculum supported such opportunity "by including local projects and field trips in its content" (I6. pg. 24) (see AM2).

4.3.4 Education *for* the environment

All teachers acknowledged the importance of teaching learners *for* the environment. They felt that it was very important for the learners to know about solutions to environmental problems. T1 noted that knowing solutions to environmental problems "will enable learners to make contributions in reducing environmental problems' (I2. pg. 8). T2, T3, T4, and T5 indicated that the importance of educating learners *for* the environment was that learners will become responsible in the future (see AM2). T4 noted that "it was important to teach learners to be part of the solution and never be part of the problem' (I5. pg. 2). T4 further noted that "learners had so many ideas to contribute therefore they needed to be educated for the environment for them to be able to make contributions to solving environmental problems" (I5. pg. 21).

All teachers also felt that it was important for learners to be involved in action in response to environmental issues. For example, T5 noted that "learners are the engines of many communities" (I4. pg. 17), so when involved in action taking, they will learn how to be responsible in the future. T1 noted "it will make learners to be appreciative and it is one way of working towards solving environmental problems' (I2. pg. 8). T3, T5 and T6 also acknowledged the importance of involving learners in action taking towards solving environmental problems.

All teachers in this study felt that it was only through realistic solutions that learners can be empowered. For example, T1 noted that "learners need to see actions for them to be empowered" (I2. pg. 8). T2 noted that "learners needed to be part of solutions to environmental problems for them to see how realistic solutions are" (I1. pg. 4). This will unlock them and when they grow up, they will always hope for attainable solutions. T5 noted that "teaching learners things which did not happen can disempower them" (I4. pg. 17). Teachers also suggested that it was better if learners could be taught solutions that could be practiced by themselves or where there was evidence such as plant trees in the schools, manage litter in the schools and re-use and recycle projects in the schools. They indicated that these solutions could be realistic as they took place within the environment which would make it easy for learners to participate every day.

4.4 DESCRIPTION OF LESSON IMPLEMENTATION AND ANALYSIS

The topics of the lessons taught by the teachers are presented below, with the environmental focus explained in brackets.

- Equatorial Rainforests (The teacher included the effects of human activities such as deforestation on the environment).
- Impacts of HIV and AIDs on education and health sectors (The teacher looked at impacts on people's lives socially or economically).
- Bush encroachment (The teacher looked at how bush encroachment poses threats to the environment).
- Natural vegetation (The teacher looked at the use of natural resources and what threats this may pose to the environment).

- Subsistence farming (The teacher looked at the threats subsistence farming poses to the environment).
- The Earth's atmosphere (The teacher included the human activities that pose threats to the Earth's atmosphere).
- Land pollution (Land pollution poses threats to the environment).
- Natural resources (The teacher looked at the use of natural resources and what threats this may poses to the environment).

In presenting the above topics, different types of knowledge "about" the environment were the focus. The following table shows the different knowledge foci of the lessons.

Table 4: Types of knowledge about the environment

Type of knowledge	T1	T2L 1	T2L 2	T3L1	T3L 2	T4	T5	T6	TOTAL
the natural processes which take place in the environment	√		√	√	√	√	√	√	7
how life is dependent on the environment	√	√	√	√	√	√	√	√	8
the impacts of human activities on the environment	√	√	√	√	√	√	√	√	8
how the present environment has been affected by past actions and decisions	√	√	√	√	√	√	√	√	8
the importance of effective action to protect the environment	√	√	√	√	√	√	√	√	8

In the following section, the 8 lessons which were presented by the 6 teachers are described. The content knowledge of lessons, methods used, intended learner competencies, how lessons were linked to local context, resources used and the teachers' teaching style are described.

4.4.1 Teacher 1: Equatorial rainforests

T1 taught a lesson on equatorial rainforests. The content of the lesson was about the distribution of the equatorial rainforests in the world, the climate and the natural vegetation of equatorial rainforests. Human activity such as deforestation in the equatorial rainforests and its effects on the natural environment, and solutions to deforestation were also part of the lesson (see LO1 in AM1).

Activities

Activity 1: Teacher gave an introduction to rainforests.
Activity 2: The teacher discussed the climatic conditions and different types of rainfall in the region.
Activity 3: The teacher asked learners to find a map of Gabon in the textbook and to look at the mean monthly temperatures and rainfall and answer the written questions. Learners were given 5 minutes to answer the questions.
Activity 4: The teacher explained the type of vegetation found in the region.
Activity 5: The teacher asked the learners to study a map of the world showing the vegetation regions of the world and answer written questions on equatorial rainforests based on the map.
Activity 6: The teacher explained the impacts of human activities, such as deforestation and soil erosion, on the environment as well as solutions to these activities.
Activity 7: The teacher asked learners to discuss solutions to deforestation. Time allocated forthe discussion was 3 minutes (see LO1 in AM1).

The table below shows how the syllabus and textbook related to the lesson plan content.

Content knowledge

Table 5: Relationships between syllabus, textbook and lesson plan content (Equatorial rainforests)

Syllabus content	**(TB1) content**	**Lesson plan content**
Distribution of equatorial rainforests on a map	Distribution of equatorial rainforests on a map	Distribution of equatorial rainforests on the map
Climate of the equatorial rainforest region	Climate of the equatorial rainforest region	Climate of the equatorial rainforest region
	Types of rainfall in the equatorial rainforest region	Types of rainfall in the equatorial rainforest region
Vegetation types of the equatorial rainforests region	Vegetation types of the equatorial rainforest region	Vegetation types of the equatorial rainforest region
Human activity in the equatorial rainforest: • Deforestation	Human activity in the equatorial rainforests: • Deforestation	Human activities in the equatorial rainforest: • Deforestation
Effects of deforestation on the natural environment		
Solutions to deforestation	Solutions to deforestation	Solutions to deforestation

The content of the lesson plan followed closely that of the syllabus and textbook. The only difference was that the textbook introduced "types of rainfall in the equatorial rainforests" while the syllabus and the lesson plan did not focus on the effects of deforestation.

On implementation, the teacher extracted content in the form of other human activities such as subsistence farming, plantation farming and timber extraction and their impacts on the environment in her presentation (see LO1 in AM1).

Learners' prior knowledge

In this lesson, learners had knowledge about what an equatorial rainforest is and why it is called rainforest. When asked by the teacher, learners indicated that the equatorial rainforest is one of the major regions south of the Sahara and it is called so because it receives rainfall throughout the year. Learners also had knowledge on how to read and interpret the map (see LO1 in AM1).

Methods

T1 used a variety of methods. These were discussion, lecture, teacher exposition/explanation, question and answer and discovery methods. When interviewed, T1 noted "I used discussion method for different experiences to be shared by learners" (I2. pg. 6). T1 also indicated that teacher exposition/explanation method was used to explain the content more clearly to the learners and allow the teacher to come in and assist learners where they did not understand. Question and answer method was also used by the teacher. When interviewed, the teacher indicated that the method was used to "test the learner's prior knowledge" (I2. pg 6). Another method used by the teacher was the discovery method. The method was used when the teacher instructed learners to look at the map, discover/identify and show the equatorial rainforest distribution.

The teacher indicated that the teaching methods used went well, although in some instances, she thought of ways to improve them. T1 noted "the method went well because learners participated, however, I need to include more visual materials such as videos so that learners see what is happening while discussing" (I2. pg. 6).

The syllabus prescribed the project method for this lesson; however, the teacher did not make use of it. The syllabus expected the teacher to use practical activities, where learners have to collect information from secondary sources on the climatic region, collect climatic data of temperature and rainfall and photographs depicting vegetation types. The syllabus also prescribed peer-teaching method, where learners can do presentations but the teacher did not do this (see AM2).

Teacher and learner interactions

The teacher called one learner to the chalkboard and instructed him to show where the equatorial rainforest is located. The learner did what the teacher instructed him to do. The teacher asked learners to describe the climatic condition of the region. Learners' answers included: hot and wet conditions. She further asked learners to mention the type of rainfall received in the region. Learners' answers included: convection rainfall. One learner asked the teacher why the vegetation in the area is tall. The teacher answered that there is high rainfall and enough sunlight. Another learner asked the instrument used to measure the height of the plants. The teacher was not sure about the answers. She told the learner that she will find out for him (see LO1 in AM1).

Competencies

The following table shows **intended** learner competencies from the syllabus, textbook and lesson plan.

Table 6: Intended learner competencies (Equatorial rainforests)

Syllabus competencies	(TB1) competencies	Lesson plan competencies
Map interpretation: indicate distribution of equatorial rainforests on the map.	Map interpretation: indicate distribution of equatorial rainforest on the map.	Map interpretation: indicate distribution of equatorial rainforests on the map.
Thinking and Interpretation of graphs: describe the climate by using climatic graphs of temperature and rainfall	Thinking and Interpretation of graphs: describe the climate by using climatic graphs of temperature and rainfall	Thinking and Interpretation of graphs: describe the climate by using climatic graphs of temperature and rainfall
	Thinking and participation: explain geographical process such as how convection currents cause convection rain, how and why the natural vegetation in the region grows tall.	
Interpretation of photographs: recognize most of the vegetation types from photographs and sketches.	Interpretation of photographs: recognize most of the vegetation types from photographs and sketches.	Interpretation of photographs: recognize most of the vegetation types from photographs and sketches.
Thinking and participation: describe human activities and their effects on the natural environment (e.g. deforestation).		Thinking and participation: describe human activities and their effects on the natural environment (e.g. deforestation).

In all cases, the lesson competencies followed those prescribed by the syllabus.

From the lesson observation there was evidence that the above **planned** competencies were **demonstrated** by learners. One of these competencies was thinking and participation. The

teacher asked learners several questions such as: why is the vegetation in the equatorial rainforests tall and evergreen? Why does the area receive convection rainfall? Learners voiced their answers to the questions. Another competency was interpretation of graphs and maps. In this case, learners were given the world map to study the distribution of the equatorial rainforests. After that, learners were able to describe the distribution of the region. Learners made use of graphs on the temperature and rainfall of Gabon to do the activity given by the teacher and they were able to find answers to the questions. Learners also examined photographs on vegetation in the equatorial rainforest and were able to describe the vegetation in the region. Interpretation of information was also achieved in this lesson. In this case, learners explained why the region is a dark, gloomy place to walk and why the forest is evergreen.

Link to local context

The teacher asked learners the type of rainfall experienced in Namibia. Learners' answers included: convection rainfall (formed when the air heats up and rises). One learner asked whether we have the same type of natural vegetation in the Caprivi region in Namibia. The teacher was not sure about the answer. She noted "I do not know really but I will find out for you" (see LO1 in AM1).

Resources

Different resources were used in presenting this lesson. These include a map of the world which was used to show the distribution of the region in the world (see LO1 in AM1). The photographs (in the textbook) were used to show the type of vegetation in the region. In this case, learners were referred to page 37 in the textbooks where the sketches of vegetation were found. Geography textbooks (TB1) were used to explain the content to the learners. Pictures and statistics in the textbook were also used by the learners for activities. The chalkboard was also used to write down the main points of the lesson. However, when interviewed, the teacher indicated that visual materials could have been used for effective lesson implementation which enables learners to understand better (see LO1 in AM1).

Teaching style

The teacher used non-verbal communication cues and showed interest in listening to the learners. She communicated with different groups in the class and engaged learners in learning. Learners were free to ask and answer questions during the lesson presentation. English was used and the majority of learners were able to express themselves in asking and answering questions (see LO1 in AM1).

4.4.2. Teacher 2 Lesson 1: HIV and AIDS

T2 L1 was about the impacts of HIV and AIDS on education and health sectors in Namibia. The lesson content include: HIV and AIDS difference, impacts of HIV and AIDS on education, government responsibility, and prevention measures for HIV and AIDS (see LO2 in AM1).

Activities

Activity 1: The teacher gave a brief introduction of HIV and AIDS.
Activity 2: Teacher asked learners to differentiate between HIV and AIDS.
Activity 3: The teacher explained how HIV and AIDS change people's lifestyles socially and economically.
Activity 4: The teacher explained the impacts of HIV and AIDS on education sectors in Namibia to the learners and the impacts HIV and AIDS have on education considering parents, teachers and learners.
Activity 5: Teacher asked learners to discuss the effects HIV and AIDS have on teachers.
Activity 6: Teacher explained the impacts of HIV and AIDS on the health sector as, nurses will become sick and unable to work, more money will be needed for medication, lack of health workers, more hospitals and clinics will be needed.
Activity 7: The teacher asked learners to think of some HIV and AIDS prevention measures (see LO2 in AM1).

Content knowledge

The table below shows how the syllabus and textbook related to the lesson content (see LO2 in AM1).

Table 7: Relationship between syllabus, textbook and lesson content (The impact of HIV and AIDS on education and health sectors)

Syllabus content	**(TB2) content**	**Lesson plan content**
Difference between HIV and AIDS	Difference between HIV and AIDS	Difference between HIV and AIDS
The impacts of HIV and AIDS pandemic on education and health sectors in Namibia	The impacts of HIV and AIDS pandemic on education and health sectors in Namibia	Impacts of HIV and AIDS on education and health sectors in Namibia
		Government responsibilities

The content of the lesson followed very closely that of the textbook and the syllabus. The only difference was that the lesson plan introduced "government responsibilities".

On implementation, the teacher delivered the lesson as planned (see LO2 in AM1).

Learners' prior knowledge

Learners had knowledge about what HIV and AIDS are. They indicated that HIV is a virus and AIDS a disease caused by the virus. Learners also discussed the impacts of HIV and AIDS on the education sector. They indicated that teachers become too weak to work and lose their jobs, and learners will therefore be without teachers which leads to poor education. Learners also suggested some HIV preventative measures such as the use of condoms, say no to sex, abstain from sex, be faithful, and get tested and awareness campaigns (see LO2 in AM1).

Methods

Three methods were used in presenting this lesson. These were discussion, question and answer and lecture methods. The teacher mostly used the question and answer method in the introduction where he was testing learners' prior knowledge. For the discussion method, the teacher put learners in groups of six and asked them to discuss HIV preventative measures. The lecture method was used to explain the lesson content to the learners (see AM2).

Teacher and learner interactions

Teacher and learner interaction only involved the eliciting of prior knowledge as described in the section above (see LO2 in AM1).

Competencies

The following table shows intended learner competencies from the syllabus, textbook and lesson plan.

Table 8: Intended learner competencies (The impact of HIV and AIDS on education and health sectors)

Syllabus competencies	**(TB2) Competencies**	**Lesson plan competencies**
Investigation: investigate the impacts of HIV and AIDS pandemic on education and health sectors in Namibia"		Investigation: investigate the impacts of HIV and AIDS pandemic on education and health sectors in Namibia
	Interpretation of graphs and tables: examine and interpret graphs and tables on HIV and AIDS in the textbook	

The lesson plan competency followed that of the syllabus. The textbook competency differs in that the textbook focused on the examination and interpretation of graphs and tables on HIV and AIDS and not on the impacts of HIV and AIDS on education and the health sectors.

From the lesson observation there was evidence that the above **intended** competencies were **demonstrated** by the learners. One of these competencies is investigation. In this case learners were asked to give the impacts of HIV and AIDS on health sectors. They were able to voice their answers to the teacher. Learners were also given a picture of HIV and AIDS symptoms for them to examine and see what an infected person looks like. The teacher asked them what was shown in the picture. Learners were able to voice their ideas. However, there was no interpretation of graphs and tables as was suggested in the textbook (see Table 5 above).

Link to local context

The teacher asked learners to explain how HIV and AIDS changed the lifestyle of their relatives and friends or for anyone they knew. Learners' answers included: most children become orphans as they lost their parents, children spend much time looking after their parents instead of going to school (see LO2 in AM1).

Resources

Geography textbook (TB2), a poster on HIV and AIDS symptoms and the chalkboard were used as resources in presenting the lesson (see LO2 in AM1). Geography textbooks were used to explain the content to the learners. A poster on HIV and AIDS symptoms was used by the learners to examine HIV and AIDS symptoms. The chalkboard was used to write the main points of the lesson explained by the teacher.

The textbook provided a table showing how birth and death rates affect populations of different countries which the teacher did not use (see LO2 in AM1).

Teaching style

The teacher used non-verbal communication cues and showed interest in listening to the learners. She communicated with different groups in the class. The teacher also showed confidence and enthusiasm in the subject and learners were motivated in answering questions. English was used and the majority of learners were able to express themselves when asking and answering questions. However, some learners had difficulties in pronouncing words such as immune, syndrome and deficiency (see LO2 in AM1). This affected the learners' participation

4.4. 3 Teacher 2 lesson 2: Bush encroachment

This lesson was about bush encroachment. The content included the natural and man-made causes of bush encroachment. It also included the effects and solutions to bush encroachment (see LO3 in AM1).

Activities

Activity 1: The teacher asked learners to define bush encroachment.
Activity 2: The teacher took learners outside the classroom to an area of bush encroachment within the school ground.
Activity 3: Teacher explained the human-made and natural causes of bush encroachment.
Activity 4: Teacher explained the effects of bush encroachment and also pointed out some solutions to bush encroachment.
Activity 5: The teacher asked learners to summarize the causes, effects and solutions to bush encroachment discussed in this lesson as homework (see LO3 in AM1).

Content knowledge

The table below shows how the syllabus and textbook related to the lesson content (see LO3 in AM1).

Table 9: Relationship between syllabus, textbook and lesson content (Bush encroachment)

Syllabus content	(TB3) content	Lesson plan content
	What is bush encroachment?	What is bush encroachment?
	Bush encroachment areas in Namibia	Bush encroachment areas in Namibia
	Causes of bush encroachment	Causes of bush encroachment
Effects of bush encroachment	Effects of bush encroachment	Effects of bush encroachment
	Solutions to bush encroachment	Solutions to bush encroachment

The content of the lesson followed exactly that of the textbook and differed from that of the syllabus content in the way that the syllabus only focused on the cause and the effects of bush encroachment while the textbook added what bush encroachment is and bush encroachment areas in Namibia.

On implementation, the teacher did not deliver the same content as planned. The teacher took learners outside the classroom to observe the area of bush encroachment, which was not part of the lesson plan. He also gave learners homework to summarize the causes of, effects of and solutions to bush encroachment which were discussed in the class, which was not reflected in the lesson plan (see LO3 in AM1).

Learners' prior knowledge

In this lesson, learners defined bush encroachment. They also suggested solutions to bush encroachment (see LO3 in AM1).

Methods

Question and answer, field work and lecture methods were used. T3 noted that a question and answer method was used because "I wanted to see whether learners have captured what I was teaching" (I5. pg. 10). He further indicated that lecturing was a good method to communicate the content to the learners. The syllabus prescribed discovery method for this lesson. In order to use this method, the teacher took learners outside the classroom to a selected area of bush encroachment near the school and discussed the features of the area, possible problems and possible solutions with the learners. When interviewed, the teacher indicated that discovery method was used to link learning to real life situations (see AM2).

Teacher and learner interactions

The teacher asked learners to define bush encroachment. Learners indicated that bush encroachment refers to a place where we have a lot of bushes. The teacher elaborated on this by giving a more clear definition of bush encroachment. She indicated that bush encroachment occurs when open savannah (grassy) areas becomes covered in dense woody plants. This is a serious environmental problem in Namibia, contributing to desertification and also affecting the economy of the country. The teacher asked learners what caused the area to be the way it is. Learners' responses included: little rainfall and poor soil. The teacher further asked them to give some natural causes of bush encroachment. Learners' responses included acid rain; climate change and poor rainfall (see LO3 in AM1).

Competencies

The following table shows **intended** learner competencies from the syllabus, textbook and lesson plan.

Table 10: Intended learner competencies (Bush encroachment)

Syllabus competencies	(TB3) competencies	Lesson plan competencies
Thinking and participation: Describe the causes and effects of bush encroachment.	Thinking and participation: Describe the causes and effects of bush encroachment	Thinking and participation: Describe the causes and effects of bush encroachment.

The lesson plan competency followed that of the syllabus and the textbook exactly.

From this lesson, it was evident that learners **demonstrated** the above **planned** competencies. Learners were asked to think about the natural causes of bush encroachment. They were also asked to suggest solutions to bush encroachment in Namibia. Learners mentioned several causes such as low rainfall, overgrazing and suggested solutions to bush encroachment by keeping fewer animals in an area to avoid overgrazing.

Link to local context

The teacher took learners outside and showed them one bushy area within the school ground. The teacher indicated that he took learners outside for real life experience. He (T2) noted that "I want my learners to experience the reality on the topic" (I2. pg. 3) (LO3 in AM1). He then asked learners as to what caused the area to be the way it is. Learners' answers included little rain and poor soils (see LO3 in AM1).

Resources

Geography textbook (TB3) environment and chalkboard were used as resources in presenting this lesson Geography textbook was used to explain the content to the learners. It was also used by the learners to examine a map of Namibia, which indicates an area where bush encroachment occurs and figures show plants that cause bush encroachment. The environment was used for learners to experience the reality of bush encroachment. The chalkboard was used to write the main points of the lesson explained by the teacher (see LO3 in AM1).

Teaching style

The teacher used non-verbal communication cues and showed interest in listening to the learners. He showed interest in working with learners and encouraged learners' participation by listening to their answers, which promoted active learning. There was good interaction between teacher and learners. English was used. A few learners experienced difficulties in expressing themselves; however, the majority of learners were able to express themselves in asking and answering questions (see LO3 in AM1).

4.4.4 Teacher 3 Lesson 1: Natural vegetation

T3L1 was about natural vegetation. The content of the lesson included: the difference between the natural vegetation and vegetation that is planted by the people. It also included the importance of vegetation on the environment, how human and natural activities destroy the vegetation and the consequences and how this vegetation can be sustainably utilized (see LO4 in AM1).

Activities

Activity 1: Teacher asked learners to define natural vegetation.
Activity 2: The teacher took learners outside the classroom to observe different types of vegetation.
Activity 3: The teacher asked learners to give the importance of trees.
Activity 4: The teacher explained the consequences of human activities on the environment and asked learners to discuss how people can use vegetation sustainably.
Activity 5: The teacher asked learners to discuss, in their groups, what they understood by: trees acting as lungs for the world (see LO4 in AM1).

Content knowledge

The table below shows how the syllabus and textbook related to the lesson plan.

Table 11: Relationship between syllabus, textbook and lesson content (Natural vegetation)

Syllabus content	(TB1) content	Lesson plan content
Natural vegetation	Natural vegetation	Natural vegetation
Importance of natural vegetation	Importance of natural vegetation	Importance of natural vegetation
	Human and natural activities which damage the vegetation (deforestation)	Human and natural activities which damage the vegetation (deforestation)
	Consequences of deforestation on the environment.	Consequences of deforestation on the environment.

The content of the lesson followed the textbook exactly. The textbook extended the syllabus content in such a way that it included the human and natural activities which damage the vegetation and the consequences of deforestation on the environment.

On implementation, the teacher delivered the lesson content as planned (see LO4 in AM1).

Learners' prior knowledge

Learners defined natural vegetation. They indicated that natural vegetation is vegetation that grows naturally in the environment. They also identified the vegetation such as Marula as natural vegetation and guava as vegetation planted by people within the school grounds and gave the importance of trees. Their answers included: shelter, oxygen, food, wood, shade and fuel (see LO4 in AM1).

Methods

Field work, discussion, lecture and question and answer method were used in presenting this lesson. Discovery method was used when the teacher took learners outside the classroom to

observe different types of vegetation within the school ground. Learners were also given a chance to discuss in their groups the importance of trees and why trees act as lungs for the world. In the introduction, the teacher used question and answer method by asking learners prior knowledge.

T3 noted that "the discussion method was very good, most of the learners participated" (I5. pg. 10). She further indicated that the use of the video could have been better as learners could have seen what was happening and observed different areas in the environment (see AM2).

Teacher and learner interactions

The teacher asked learners to discuss how people can use the natural vegetation sustainably. Learners' responses included: not cutting down trees, plant more trees and recycle the used products (see LO4 in AM1).

Competencies

The following table shows **intended** learner competencies from the syllabus, textbook and lesson plan.

Table 12: Intended learner competencies (Natural vegetation)

Syllabus competencies	**(TB1) competencies**	**Lesson plan competencies**
		Observation competencies: taking learners outside to observe vegetation.
Thinking and participation: explain how vegetation can be sustainably utilized.	Thinking and participation: explain how vegetation can be sustainably utilized.	Thinking and participation: explain how vegetation can be sustainably utilized.

The lesson plan competency followed that of the textbook and syllabus, but there was an additional competency of observing the vegetation suggested in the syllabus and textbook which the teacher used during implementation of the lesson.

From the lesson observation there was evidence that the above **intended** competencies were **demonstrated** by learners. Learners demonstrated thinking and participation competencies through answering questions posed by the teacher. The teacher asked questions such as: Why are the trees important to people? What can be done to protect the vegetation? Learners were able to respond to questions. Learners were also seemed to be competent in observing. When taken outside, they made a careful observation of the vegetation in the school grounds. Upon returning to the class, they explained the type of vegetation they observed outside.

Link to local context

The teacher took learners outside the classroom to observe the vegetation within the school ground. After coming back to the class, the teacher asked learners to mention the types of vegetation they saw. Learners' answers included: Marula and Mopani trees identified as natural vegetation and palm and guavas trees as planted by people (see LO4 in AM1).

Resources

The Geography textbook (TB1) and the poster were used. The textbook was used as a source of information for the teacher to explain the content to the learners. The textbook was also used by learners to examine a figure which shows natural vegetation in the wetter northern part of Namibia. A poster was also used to explain the importance of trees to the learners (see LO4 in AM1).

Teaching style

The teacher was fair to all learners by giving all of them chances to answer questions. Discipline problems were handled in a good way and she tried to communicate with different groups in the

class. English was used and most of the learners were able to express themselves (see LO4 in AM1).

4.4.5 Teacher 3 lesson 2: Subsistence farming

T3L2 was about subsistence farming. The content of this lesson included: the processes and effects of subsistence farming. It also looked at solutions to the effects of subsistence farming such as deforestation and soil erosion (see LO5 in AM1).

Activities

Activity 1: The teacher distributed posters to the learners for them to discuss in their groups what was shown.
Activity 2: The teacher explained the processes of land cultivation on subsistence farming.
Activity 3: The teacher asked learners to think of some solutions to the effect that subsistence farming has on the environment.
Activity 4: The teacher gave learners class work on causes of desertification and solutions to deforestation (see LO5 in AM1).
Activity 5: The teacher asked learners to study a figure showing causes of deforestation and another figure showing several factors which lead to desertification. Learners then had to answer written questions (see LO5 in AM1).

Content knowledge

The table below shows how the syllabus and textbook related to the lesson content.

Table 13: Relationship between syllabus, textbook and lesson content (Subsistence farming)

Syllabus content	(TB2) content	Lesson plan content
Subsistence farming	Subsistence farming	Subsistence farming
Processes of subsistence farming -Cultivating -Harvesting -Winnowing -Storage	Processes of subsistence farming -Cultivating -Harvesting -Winnowing -Storage	Processes of subsistence farming -Cultivating -Harvesting -Winnowing -Storage
		Effects of subsistence farming on the environment -Deforestation -Soil erosion
		Solutions to deforestation and soil erosion
	Type of products from subsistence farming and how they are sold at informal markets.	

The content of the lesson differed from that of the textbook and the syllabus. The difference is that the textbook and syllabus did not focus on the effects and solutions of subsistence farming such as deforestation and bush encroachment. The textbook also introduced type of products from subsistence farming and how they are sold at informal market, but this was excluded from the lesson plan.

On implementation, the teacher delivered the lesson content as planned.

Learners' prior knowledge

Learners identified the process of subsistence farming shown on the posters. They voiced their ideas about the farming processes in a whole class discussion prompted by the teacher to describe what was shown in the posters. Learners suggested solutions to deforestation and soil erosion. In their answers, learners suggested solutions such as; stop cutting down trees, not to keep many animals in a very small plot, use crop rotation (see LO5 in AM1).

Methods

Discussion, lecture, question and answer methods were used. Question and answer method was used when the teacher posed questions to the learners to test their prior knowledge. Discussion method was used when the teacher grouped learners to do the class work. Lecture method was used when the teacher explained the content to the learners (see AM1).

Teacher and learner interactions

The teacher asked learners to tell what would happen if the population grew very fast. Learners' answers included: deforestation, overgrazing, soil erosion and desertification would occur (see LO5 in AM1).

Competencies

The following table shows **intended** learner competencies from the syllabus, textbook and lesson plan.

Table 14: Intended learner competencies (Subsistence farming)

Syllabus competencies	(TB2) competencies	Lesson plan competencies
Thinking and participation: describe at least one representative example of subsistence farming.	Thinking and participation: describe at least one representative example of subsistence farming	Thinking and participation: describe at least one representative example of subsistence farming.
	Thinking and participation: suggest solutions to deforestation and soil erosion.	Thinking and participation: suggest solutions to deforestation and soil erosion.
	Interpretation of photographs: look at photographs and identify what is shown.	Interpretation of photographs: look at photographs and identify what is shown.

The lesson plan competency followed that of the textbook and syllabus. The only difference was that the syllabus did not focus on solutions to deforestation and bush encroachment as well as the interpretation of photographs competency.

From the lesson observation there was evidence of several **intended** competencies **demonstrated** by learners. One of the competencies was thinking and participation. Learners were asked to think and suggest solutions to deforestation and soil erosion, which were the effects of subsistence farming. Learners suggested several solutions to bush encroachment such as prevention of overstocking. Another competency which was demonstrated by the learners was interpretation of photographs. Learners were asked to examine and identify the poster which was showed the photographs on the processes of subsistence farming. Learners were able to identify what the photographs showed such as ploughing, harvesting, winnowing and storage.

Link to local context

The teacher asked learners to mention the type of farming they did at their homes and explain how they did it. Learners' answers included: subsistence and communal farming, where they first have to do ploughing, sowing, cultivating and harvesting (see LO5 in AM1).

Resources

A Geography textbook (TB2) and a poster on the processes of subsistence farming were used. The Geography textbook was used as a source of information for the teacher to explain the content to the learners. A poster on the processes of subsistence farming, which was taken from the textbook, was also used by the learners as a source of information (see LO5 in AM1).

Teaching style

The teacher was fair to all learners by giving all of them chances to answer questions. Discipline problems were handled in a good way and she tried to communicate with different groups when learners were working. English was used and most of the learners experienced difficulties in answering questions posed by the teacher. Only few of them were able to express themselves (see LO5 in AM1). This affected the learners' participation as most of the learners could not say anything in the class.

4.4.6 Teacher 4: The Earth's atmosphere

T4 taught about the Earth's atmosphere. The content of this lesson included the lower three layers of the atmosphere (troposphere, stratosphere and mesosphere) and their basic features (see LO6 in AM1).

Activities

Activity 1: The teacher instructed learners to turn to page 41 in the Geography textbook and study the sketch of the earth's atmosphere.

Activity 2: The teacher asked learners to describe the features of the troposphere layer, using the sketch they were referred to.

Activity 3: The teacher asked learners to describe the features of the stratosphere and mesosphere layers.

Activity 4: The teacher asked learners as to what would happen if there was no ozone layer.

Activity 5: The teacher gave learners a puzzle on layers of the atmosphere to complete as homework (see LO6 in AM1).

Content knowledge

The following table shows how the syllabus and textbook related to the lesson content.

Table 15: Relationship between syllabus, textbook and lesson content (The Earth's atmosphere)

Syllabus content	**(TB2) content**	**Lesson plan content**
Layers of the atmosphere	Layers of the atmosphere	Layers of the atmosphere
Features of the three layers of the atmosphere	Features of the three layers of the atmosphere	Features of the three layers of the atmosphere

The content of the lesson plan followed exactly that of the textbook and the syllabus.

The teacher did not deliver the same content that was planned.

On implementation, the teacher included the destruction and importance (why it should be protected) of the ozone layer which was not included in this lesson plan (see LO6 in AM1).

Learners' prior knowledge

Learners mentioned and described the features of the three layers of the atmosphere. Learners' answers included: nearest to the earth, consists of air, stretches up to 12km above the surface for troposphere, layer above the troposphere, stretches to 12-50km above the earth's surface, contains ozone for the stratosphere and coldest layer up to -100c, stretches about 50-80km above the earth surface for the mesosphere (see LO6 in AM2).

Methods

Discussion, question and answer and lecture were used. Question and answer method was used because the teacher (T4) wanted to get learners' prior knowledge of the topic. The teacher also noted that "I used lecture method because it was just a matter of informing the learners about the topic" (I4. pg. 19) (see AM2).

Teacher and learner interactions

Teacher asked learners to define ozone layer and give its importance. Learners were not able to answer the questions. The teacher asked learners to give the effects of the ozone layer on human beings. Learners' answers included skin cancer and eye problems. The teacher asked learners what damaged the ozone layer. Learners were not able to answer the question. The teacher explained to them that the damage included the use of CFCs (Chlorofluorocarbons) in sprays, aerosols and refrigerators which are not environmental friendly (see LO6 in AM1).The teacher further told learners that the solution to this damage was to stop using products with CFCs.

Competencies

The following table shows **intended** learner competencies from the syllabus, textbook and lesson plan.

Table 16: Intended learners competencies (The Earth's atmosphere)

Syllabus competencies	(TB2) competencies	Lesson plan competencies
Interpretation of sketches: indicate on the sketch the lower three layers of the atmosphere and describe the basic features of each.	Interpretation of sketches: indicate on the sketch the three layers of the atmosphere and describe the basic features of each.	Interpretation of sketches: indicate on the sketch the lower three layers of the atmosphere and describe the basic features of each.
Evaluation: evaluate the importance of ozone layer.	Evaluation: evaluate the importance of ozone layer.	

The lesson plan competency followed that of the textbook and syllabus. The only difference was that the syllabus and the textbook introduced "evaluation competency: evaluate the importance of ozone layer".

From this lesson observation there was evidence that the above **intended** competencies were **demonstrated** by the learners. Learners were asked to carefully study the sketch on the three layers of the atmosphere on page 39 in the textbook. After that, the teacher asked them to describe the features of each layer. Learners were able to use the sketch to describe the basic features of the three layers of the atmosphere. However, learners were not able to describe what caused the thinning of the ozone layer.

Link to local context

The teacher did not link the lesson to local context.

Resources

Geography textbook (TB2) and a sketch on the three layers of the atmosphere were used. Geography textbook was used to explain the content to the learners. A sketch showing the three layers of the atmosphere and a diagram showing the layer of ozone, which were taken from the

textbook were also used to communicate the lesson content to the learners (see also LO6 in AM1).

Teaching style

Appropriate use of non-verbal communication cues were used by the teacher. She showed interest in listening to learners. She was fair to learners and supported learner-centred paradigm. English language used and learners were able to express themselves when answering questions (see LO6 in AM2).

4.4.7 Teacher 5: Land pollution

T5 taught a lesson about land pollution. The lesson content included causes of, effects of and solutions to land pollution (see LO7 in AM1).

Activities

Activity 1: Teacher asked learners to define the term pollution.
Activity 2: Teacher explained the causes of land pollution.
Activity 3: Teacher asked learners to give the negative effects of land pollution especially on tourism which is one the main contributions to the Namibian economy.
Activity 4: Teacher asked learners to think of some solutions to land pollution. Learners were given five minutes to think and suggest solutions.
Activity 5: Teacher asked learners how they could avoid land pollution in their own school (see LO7 in AM1).

Content knowledge

The following table shows how the syllabus and textbook related to the lesson content.

Table 17: Relationship between syllabus, textbook and lesson content (Land pollution)

Syllabus content	(TB3) content	Lesson plan content
Describe pollution of the land	Describe pollution of the land	Describe pollution of the land
	Causes of land pollution	Causes of land pollution
	Effects of land pollution	Effects of land pollution
	Solutions to land pollution	Solutions to land pollution

The content of the lesson plan followed that of the textbook. The syllabus content differed from that of the lesson plan and textbook in that it did not focus on the causes, effects and land pollution.

On implementation, the teacher delivered the lesson content as planned (see LO7 in AM1).

Learners' prior knowledge

Learners defined the term pollution. Learners' responses included: when human activities poison the air, land and water. Learners mentioned the effects of land pollution such as and possible solutions to land pollution. Learners' answers on the effects of land pollution included: litter kills animals and causes diseases. Learners were also able to suggest possible solutions to land pollution. Their answers included: recycle paper, re-use products and stop throwing used products on the ground, awareness campaign (see LO7 in AM2).

Methods

Question and answer was used in presenting this lesson. The teacher indicated that question and answer method was used because learners were expected to know (have knowledge about) what was happening in their environment, that would enable them to answer questions.

T5 indicated that the teaching method used did not go well. She noted that "the method did not go well" (I4. pg. 15). She further indicated that learners showed an understanding of the lesson content but "I need to come up with a suitable teaching method next time" (I4. pg. 15).

The syllabus prescribes the discovery method for this lesson which the teacher did not use. The syllabus prescribed that the teacher takes learners outside the classroom to a selected area near the school and to discuss the features of the area (see AM2).

Teacher and learner interactions

Teacher asked learners to give the negative effects of land pollution on tourism which is one the main contribution to the Namibian economy. Learners' answers included: environment will look ugly; environment will be spoiled that it will discourage tourists not to come back to Namibia anymore. The teacher asked learners as to how they could avoid land pollution in their own school. Learners' responses included: put all rubbish in the bin, do cleaning campaign in the school (see LO7 in AM1). The teacher told the learners that they should keep the school environment clean

Competencies

The following table shows **intended** learner competencies from the syllabus, textbook and lesson plan.

Table 18: Intended learner competencies (Land pollution)

Syllabus competencies	Textbook competencies	Lesson plan competencies
Describing Information: describe pollution of the land		Describing Information: describe pollution of the land
Thinking: suggest solutions for problems from their own vicinity	Thinking: suggest solutions to land pollution.	Thinking: suggest solutions for problems from their own vicinity
Application and problem solving: transfer and apply this knowledge to the solution of problems in other areas.		Application and problem solving: transfer and apply this knowledge to the solution of problems in other areas.

The lesson plan competencies followed that of the syllabus. The textbook competency was different in that it only focused on suggesting solutions to land pollution.

From lesson observation there was evidence that most of the above **intended** competencies were **demonstrated** by the learners. One of these competencies was describing the information. Learners were able to describe the information on land pollution. Another competency was thinking and participation. Learners were asked to think of the causes and suggest solutions to land pollution. Problem solving competencies were also demonstrated, whereby learners defined the problem (land pollution); demonstrated knowledge of possible solutions to land pollution and exhibited behaviour that enabled them to make decisions. There was no evidence of applying knowledge to the solution of problems in other areas and such competency was not realized.

On implementation, the teacher delivered the lesson content as planned (see LO7 in AM1).

Link to local context

The teacher asked learners to suggest how they could avoid pollution within their school environment. Learners' suggestions included: cleaning put all rubbish in the bin and do cleaning campaigns (see LO7 in AM1).

Resources

Geography textbook (TB3) was used by the teacher to explain the content to the learners (see LO7 in AM1).

Teaching style

Appropriate use of non-verbal communication cues were used by the teacher. She showed an interest in listening to learners and communicated with different groups. English was used and learners were able to express themselves when answering questions (see LO7 in AM1).

4.4.8 Teacher 6: Natural resources

T6 taught a lesson on natural resources. The content of the lesson included the difference between renewable and non-renewable resources; examples of renewable and non renewable resources and sustainable use of natural resources (see LO8 in AM1).

Activities

Activity 1: Teacher gave an introduction to resources by asking learners to define natural resources.
Activity 2: Teacher asked learners to give any examples of the natural resources they know.
Activity 3: Teacher asked learners to differentiate between renewable and non-renewable resources.

Activity 4: Teacher asked learners to list examples of renewable and non renewable resources they know in their groups. Learners were given 5 minutes to finish the activity.

Activity 5: Teacher explained how natural resources could be used sustainably, so that they last longer for the future generations.

Activity 6: Teacher asked learners to look at the written list of resources and differentiate them into renewable and non-renewable resources (see LO8 in AM1).

Content knowledge

The following table shows how the syllabus and textbook related to the lesson content.

Table 19: Relationship between syllabus, textbook and lesson content (Natural resources)

Syllabus content	**(TB1) content**	**Lesson plan content**
Define natural resources	Define natural resources	Define natural resources
Renewable and non-renewable resources	Renewable and non-renewable resources	Renewable and non-renewable resources
Examples of renewable and non-renewable resources	Examples of renewable and non-renewable resources	Examples of renewable and non-renewable resources
Sustainable use of natural resources	Sustainable use of natural resources	Sustainable use of natural resources

The content of the lesson plan followed exactly that of the textbook and the syllabus.

On implementation, the lesson content was delivered as planned (see LO8 in AM1).

Learners' prior knowledge

Learners defined the term resources. Their answers included: something natural, something not man- made, something that is useful. Learners also differentiated between renewable and non renewable resources. Their responses include: vegetation, water, minerals. They also gave

examples of renewable and non-renewable resources. Their answers included: renewable – do not get finished; and non-renewable cannot be replaced after being used up (see LO8 in AM1).

Methods

Question and answer, discussion and lecture methods were used in presenting this lesson. The teacher started his lesson with a series of questions to test the learner's prior knowledge. Learners were also allowed to discuss different resources and divide them into renewable and non-renewable. When interviewed, the teacher indicated that the discussion method was used because "it allows my learners to interact and learn more from one another" (I6. pg. 23) and helps them to engage themselves in the lesson (see AM2).

Teacher and learner interactions

The teacher asked learners to give any of the natural resources they knew. Learner's responses included: vegetation, water, minerals (see LO8 in AM1).

Competencies

The following table shows **intended** learner competencies from the syllabus, textbook and lesson plan.

Table 20: Intended learner competencies (Natural resources)

Syllabus competencies	**(TB1) competencies**	**Lesson plan competencies**
Defining and explaining information: define renewable and non-renewable resources Explain why and how renewable and non-renewable can be sustainably used.		Defining and explaining information: define renewable and non-renewable resources Explain why and how renewable and non-renewable can be sustainably used.

The lesson plan competencies followed that of the syllabus exactly. There was no competency prescribed in the textbook.

From lesson observation there was little evidence that the above **intended** competencies were **demonstrated** by the learners. Learners defined the terms natural resources, renewable, non renewable resources. Learners, however, did not show any evidence of explaining and reasoning for the sustainable use of natural resources.

Link to local context

The teacher did not link the lesson to local context.

Resources

Geography textbook (TB1) was used to by the teacher to explain the content to the learners (see LO8 in AM1).

Teaching style

Appropriate use of non-verbal communication cues were used by the teacher. She showed interest in listening to learners and communicated with different groups. English was used and learners were able to express themselves when answering questions (see LO8 in AM1).

4.5 CONCLUSION

This chapter presented the data on education *about, in/through* and *for* the environment, which was generated from document analysis and lesson observations. In addition, the chapter presented data from interviews about the experiences and intentionality of teachers' lesson plans and lesson implementation on environmental learning.

Analytical memos were constructed, which summarized what was observed, what was read from relevant documents analyzed and what participants said in the interviews. The analytical memos grouped the data into categories which were used in presenting data in this chapter.

The results presented in this chapter are discussed in the next chapter in more depth and in relation to the literature review in Chapter 2.

CHAPTER 5: DISCUSSION OF FINDINGS

5.1 INTRODUCTION

This chapter discusses the findings presented in Chapter 4. The findings are discussed by drawing on some of the insights gained from the literature review in Chapter 2. The discussion considers the research question: How is education *about, in/through* and *for* the environment incorporated in the Geography Junior Phase curriculum?

To facilitate the discussion, the data was condensed into the following 6 analytical statements:

1. Teachers selected teaching methods and activities which predominantly supported education 'about' the environment.
2. Specific types of knowledge "about" the environment dominated the findings of the case study.
3. The way teachers used the resources exclusively supported education 'about' the environment.
4. Linking learning to the local context encouraged education *in/through* the environment.
5. Education *for* the environment was addressed, but the scope was limited.
6. Teachers used competencies prescribed within the syllabus to structure learning *about, in/through* and *for* the environment.

5.2 ANALYTICAL STATEMENTS

5.2.1 Analytical statement 1:

Teachers selected teaching methods and activities which predominantly supported education 'about' the environment.

Teaching methods are "a combination of learner activities supported by the use of appropriate learning support materials to provide a particular learning experience to bring about the desired

learning outcomes" (Ministry of Education, 2001:179). The predominant methods used by teachers were question and answer (discussion), textbook and lecture methods. The question and answer and lecture methods were used by all teachers in this study (see Methods in Sections 4.4.1 – 4.4.8).

Question and answer (discussion) method

The question and answer method is one of the most important distinctions of constructivist teaching methods (Jonassen, 1999). The method involves a greater degree of teacher-learner interaction, where communication flows between the teacher and learners and eventually between learners themselves. The method is suitable with small groups. Most teachers, however, in this study taught large classes which ranged from 29 to 42 learners (see Section 4.2). As learners were working in groups, this made it easier for teachers to involve all learners in their lesson presentations. All learners got chances to participate and share ideas with others in their groups. This meant that all learners seemed to have a chance to participate (see Methods in Sections 4.4.1, 4.4.2, 4.4.4, 4.4.5 and 4.4.8).

In using this method, questions and answers were the main mode through which the content was discussed with learners. The teacher tested the learners' prior knowledge by asking them several questions about the topic (see Prior knowledge in Sections 4.4.1 - 4.4.8). This meant that learners tried to use their previous knowledge to answer the questions. Through the question and answer strategy, teachers were likely to build on learners' existing knowledge to encourage deeper understanding.

The discussion method used by the teachers was based on a learner-centred approach. It seemed to encourage interaction and working together and provided opportunity for learners to practice acquired knowledge (see Teachers and learner interactions in Sections 4.4.1- 4.4.8). The method seemed to distribute responsibility for learning among learners and learners had to find out information from each other.

With the learner-centred approach learners are at the centre of learning. In this study all teachers started (introduced) their lessons by drawing on the prior knowledge of learners. This was done by asking them questions. This is in line with the Namibian Policy, *Towards Education for All*, which stated that the starting points for teaching should be the learner's existing knowledge, skills and understanding (Namibia: Ministry of Education, 1993).

The Ministry of Education (1996) also indentifies the following as the main strategies for Learner-Centred Education:

- the starting point for teaching should be the learner's existing knowledge, skills, interest and understanding, derived from previous experiences in and out of school
- the natural curiosity and eagerness of all young people to learn to investigate and to make sense of a widening world must be nourished and encouraged by challenging and meaningful tasks
- the learner's perspective needs to be appreciated and considered in the work of the school (Ministry of Education, 1996:60).

Learning depended on learners making links between the existing knowledge and the new knowledge encountered. In most of the lessons learners were asked, in groups and individually, to define, differentiate and suggest solutions to environmental problems using their existing knowledge. The questions stimulated the learners to apply the knowledge and content they had learned previously. This promoted education about the environment.

Most of the learners were able to express themselves in English although English is their second language (see Teaching style in Sections 4. 4.1, 4.4.3, 4.4.4, 4.4.6, 4.4.7 and 4.4.8). They mostly communicated with others, especially when they were outside the classrooms, in "*Oshiwambo*", which is their first language.

A few learners were not able to express themselves in English (see Teaching style in 4.4.2 and 4.4.5). This limited learners' participation in the topics under discussion as they were not able to give their previous knowledge about these topics.

As presented in Chapter 4, learners defined equatorial rainforests (see Prior knowledge in Section 4.4.1, bush encroachment (see Prior knowledge in Section 4.4.3), pollution (see Prior knowledge in Section 4.4.7), differentiated between HIV and AIDS (see Section 4.4 2), natural and man-made vegetation (see section 4.4.4), renewable and non-renewable resources (see Section 4.4.8) and suggested solutions to bush encroachment (see Section 4.4.3, pollution (see Section 4.4.7 and deforestation (see Section 4.4.1) in their discussions. This was done as teachers believed that learners understood better when they discussed things among themselves as they share different experiences with each other.

For (T3) LO2, learners were able to read the map of Gabon in an attempt to answer some questions. In this case, learners learned about investigating climate in an equatorial rain forest region as they tried to work out the highest and lowest temperature, range of temperature and total rainfall (see Activities in Sections 4.4.1).

After the learner's answers, most teachers prompted a whole class discussion and added more to what was said by the learners. It is likely that through this method, learners made links between what they knew and what was said by the teacher. It was also likely that they accumulated new experiences and insights 'about' the environment such as the climatic conditions of the equatorial rainforest, how bush encroachment occurs and natural and man-made causes of bush encroachment, how people can sustainably use natural resources, effects of overpopulation on the environment, the ozone layer, its importance and effects on human beings and the effects of land pollution on tourism (see Teacher and learner interaction in Sections 4.4.1, 4.4.3, 4.4.4, 4.4.5, 4.4.6, 4.4.7and 4.4.8).

In most lessons, learners were able to respond to the questions relying on their prior knowledge (see Section 4.2). It was evident that they had substantial knowledge of the topics taught. However, it was observed that teachers did not give the learners enough time to think about the

questions in order for them to provide answers (see Activities in Sections 4.4.1, 4.4.5 and 4.4.6). Learners were not able to finish their discussions within the given period but teachers gave feedback on their answers and provided further clarification.

In some instances, learners were reading from maps and the textbooks as instructed by the teachers (see Sections 4.4.1 and 4.4.6). This made the lessons more enjoyable as all learners were eager to give answers to questions. However, this did not indicate the prior knowledge learners had and the new knowledge they gained.

In support of the analytical statement, the question and answer method was selected and used by all teachers to get learners' prior knowledge of the topics. This supported education *about* the environment as it provided learners with opportunities to learn about the functioning of the environment.

Lecture method

This is another method practiced by all the teachers involved in this study. The method was used following the learners' answers (see Methods in Section 4.4.2). Using the learners' answers, the teachers explained what they thought the learners should know 'about' the environment. Teachers had sufficient communication skills to ensure that all learners understood the lesson content. They clearly explained new environmental concepts to the learners in simple and clear language, which promoted education *about* the environment.

In LO2, the teacher used the lecture method to take learners beyond their prior knowledge. The lecture method was used following on what learners knew. The teacher explained to the learners how HIV and AIDS change people's lifestyles socially and economically. He also explained the impacts that HIV and AIDS have on education by considering parents, teachers and learners. The teacher also explained the impacts of HIV and AIDS on the health sector to the learners (see Activities in Section 4.4.2). This method enabled learners to acquire a fundamental understanding, as well as learning the terminologies and key concepts 'about' the environment.

Activities

Findings in this case study revealed that the written activities given to the learners promoted factual recall knowledge "about" the environment. T1 asked learners to define equatorial rainforests. T2 asked learners to differentiate between HIV and AIDS and define bush encroachment. T3 asked learners to give the importance of trees and discuss the processes of subsistence farming shown on the posters provided to them. T4 asked learners to give the features of the three layers of the atmosphere. T5 asked learners to define pollution. T6 asked learners to differentiate between renewable and non-renewable resources and gave examples of each (see Activities in Sections 4.4.1 – 4.4.8).

Some of the activities used by teachers were not in line with those prescribed by the syllabus. T3, in his first lesson took learners outside the classroom to observe the type of vegetation found in the school ground, which was not part of the syllabus (see Activities in Sections 4.4.1). This promoted education *in/through* the environment as learners experienced the reality of the types of vegetation in the school ground. In her lesson 2 (T3), the teacher asked learners to identify and analyze information shown in the photographs. She also asked learners to suggest solutions to deforestation and soil erosion which was not part of the syllabus (see Activities in Sections 4.4.5). This promoted education *about* and *for* the environment. Identifying and analyzing information gives learners sound knowledge about the topic as they discuss and interpret what is to be analyzed. Asking them to suggesting solutions to environmental problems could help learners to developed critical thinking and problem solving skills.

T4 asked learners to evaluate the importance of the ozone layer which was not part of the syllabus. This promoted education *about* the environment as it enabled learners to respond to environmental issues such as the depletion of the ozone layer (see Activities in Section 4.4.6).

T1's lesson referred to a section of the syllabus that prescribes that learners go into the field and collects information/data on rainfall and temperature and that learners should do presentations on their work (see Section 4.4). Instead of taking learners into the field, the teacher only referred to

what should have been done. This limited education *in/through* the environment as learners could not experience the reality.

T7's lesson also referred to a section of the syllabus that prescribes that learners transfer and apply the knowledge they were taught about solutions to environmental problems in their areas to the solution of problems in other areas of the world. The teacher planned this, but did not include it in her lesson presentation. This limited education *for* the environment as learners could not understand that they were part of the problems and solutions associated with other parts of the world (see Section 4.4.7).

It is discussed in Chapter 2 of this study (see Section 2.8) that Geography also provides opportunities for learners to learn *in/through* and *for* the environment. This can be done by using and appreciating the environment through fieldwork activities and developing attitudes which promote sustainable living (see Section 2.3). This implies that Geography teachers should use fieldwork activities to enable learners to appreciate their environments and make well informed decisions about their environments, which promote education *in/through* and *for* the environment.

If teachers had followed the activities which the syllabus prescribed, they could have addressed all the three forms of environmental education (education *about, in/through* and *for* the environment). As discussed in Chapter 2 of this study, these forms are clearly interrelated. Learners need to be taught *about, in/through* and *for* the environment as education for the environment builds on education *about* and *in/through* the environment. Without being taught *for* and *in/through* the environment, they will not develop an informed concern for the environment and skills to participate in environmental protection (see Section 2.3).

Five teachers set group work activities which promoted collaboration (see Activities in Sections 4.4. 1, 4.4.2, 4.4.4, 4.4.5 and 4.4.8). However, very limited time was given to complete tasks (see Activities in Sections 4.4.1, 4.4.4, 4.4.5, 4.4.7 and 4.4.8). Learners were not able to discuss much before they gave feedback especially where they had to study the maps, diagrams and tables in order to answer the questions (see Competencies in Sections 4.4.1 and 4.4.5). Learners needed

more time to discuss and understand the activity under discussion. Some teachers gave individual work to their learners (see Activities in Sections 4.4.1, 4.4.4 and 4.4.6). Learners were able to do the activities on their own, However, not every learner got a chance to report back to the teacher.

Giving more work to the learners, especially group/collaborative work, promoted a learner-centred approach, thus, supported education 'about' the environment as learners shared their knowledge and experiences with others in their groups. In this view, teaching created opportunities which enabled learners to explore different ways of knowing and developing thinking and participation capabilities as reported in Chapter 4 (see Competencies in Section 4.4).

In summary, activities used by teachers in this study promoted education *about* the environment as these activities required factual recall of knowledge. In one case, the teacher asked learners to evaluate the importance of the ozone layer which was not part of the syllabus. Activities given in groups promoted a learner-centred approach, which promoted education *about* the environment.

Although I have argued that methods and activities predominately supported education *about* the environment, there was also evidence of education *in/through* and *for* the environment. These are discussed in the following paragraphs.

Teachers T2 and T3 took the learners out of the classrooms to do observations of the school environments. For Teacher 2, learners observed the area of bush encroachment while for T3 they observed the vegetation around the school (see Teacher and learner interactions in Sections 4.4.3 and 4.4.4). This promoted education *in/through* the environment and helped to developed observation skills in learners. This is consistent with the findings of Fien (1998), who noted in Chapter 2 that using the environment as a resource for learning can develop observation skills (see Section 2.3). It is also discussed in Chapter 2 that education *in/through* the environment is a pedagogical technique that uses the environment as a resource for learning. The environment as a resource for learning can guide and stimulate learning as learners can look at, touch and examine the resource.

Since learners seemed to separate what is taught at school from the real world, using the environment as a resource for learning and linking learners to local context can be a good way of bridging the gap between the school world and the real world. This enables learners to apply what they learned in schools to daily life. Learners will be dependent on the Namibian environment throughout their lives. This was therefore, a good opportunity for them to deal with environmental problems in their societies and manage their environment in a way that is of benefit to all. This will teach them skills such as investigation and problem solving.

These findings support Palmer and Neal's (1994) findings in Chapter 2 of this study that, successful teaching will involve the learner in learning through the environment when the teacher uses relevant first hand resources and real life experiences as a basis for learning and working outside the classroom as a natural extension of the environment (see Section 2.3). The same findings were reported in Chapter 4 that working *in/through* the environment leads to the acquisition of knowledge and understanding about the environment as a result of real life experiences (see Section 4.3.3).

In Chapter 2 of this study, it is discussed that using the environment as a resource may also foster environmental concerns if learners become captivated by the importance and fragility of ecosystems and the beauty of the landscape, or immersed in the values conflict over an environmental issue (Fien, 1993). In this study, the environment was used as a resource for learning (see Activities Section 4.4.3). This promoted education *for* the environment as their direct experiences of the impacts of bush encroachment fostered environmental concerns in them.

From what is stated above, using the environment as a resource for learning does not only encourage education *in/through* the environment, but also *about* and *for* the environment. This means that exploring the environment enables learners to understand environmental issues, make judgments, suggest solutions and take actions towards environmental problems.
Although the study found that most teachers used learner's prior knowledge to make sense of the lesson content as they struggled to localize environmental issues and make use of local examples, this case study has shown that they all acknowledged the importance of using

fieldtrips and linking the contents to local context (see Section 4.3.3). T1, for example, felt that, in using fieldtrips, learners become aware of the reality that surrounds them. Learners will only be able to connect theory to practice if they see things happening. This implies that taking learners for field-trips will make learners understand the content better.

In the interviews, all teachers acknowledged the importance of using resources such as the environment and other visual resources, which encourage education *in/through* the environment (see Section 4.3.2). They indicated that they could not use appropriate teaching and learning resources because they were not available, otherwise, they could have been used for effective lesson implementation (see Resources in Sections 4.4.1, 4.4.4 and 4.4.8). Textbooks were used as major sources of information because they were mostly available (see Resources in Section 4. 4.1- 4.4.8).

5.2.2 Analytical statement 2:

Most types of knowledge about the environment were covered in this study.

In Chapter 2 of this study different types of education about the environment are discussed (see Section 2.3). In Chapter 4 it is reported that most types of knowledge about the environment were covered in all lessons (Table 1). How life is dependent on the environment, impacts of human activities on the environment, how the present environment has been affected by past actions and decisions and the importance of effective action to protect the environment were covered in all lessons. The natural processes that take place in the environment were only covered in one lesson.

As discussed in Chapter 2 of this study, it is through Geography that learners accumulate valuable knowledge 'about' the environment and learn about the interrelationships between them (learners) and the environment. The chapter further discussed that Geography makes people aware of the activities affecting their environment and develops an interest for managing the environment.

This corresponds with what is reported in Chapter 4 of the study (see Teachers and learners interaction Sections 4.4.1, 4.4.5, 4.4.6 and 4.4.7) that teachers focused on natural processes such as types of rainfall and vegetation that take place in the environment, human activities such as subsistence farming and their impacts on the environment and sustainable use of resources and its importance. They also focused on solutions to these environmental problems and why they are important for the environment.

This enabled learners to discover the causes and impacts of environmental problems. This would also enable learners to examine the complexity and interrelatedness of natural systems and how humans interact with and affect those systems. In developing a thorough understanding of systems, learners can examine the origins and impacts of environmental problems and analyze the implications for future environmental problems.

5.2.3 Analytical statement 3:

The way teachers used the resources exclusively supported education 'about' the environment.

Schunk (2004) admits that teachers should make sure that learners are actively involved with the content through the use of teaching resources/materials. Schunk's statement is in accordance with the findings of this study that all teachers observed used different teaching and learning resources namely, textbooks (mainly used by all teachers), posters and maps to actively involve their learners during lesson presentations. The focus, method and the way in which resources were used influenced the type of environmental learning that took place in the classrooms. This is explained below.

It is reported in Chapter 4 of this study that all teachers used textbooks to explain their lesson content to the learners (see Methods in Sections 4.4.1 - 4.4.8). In this case, teachers used a selected textbook covering the learning content to serve as the starting point for planning, preparation, organization and implementation of the lessons (see Table 1). There is no evidence in this study that any of the teachers used other books apart from the textbooks or that they

encouraged learners to make use of libraries. According to the Ministry of Education (2001), textbooks are one of the most central teaching resources and extremely important source of learning. Duminy, Dreyer and Steyn (1990:172) stated that the "textbook can serve as a basis for self study and other classroom activities by pupils".

This case study found that using the textbook as a resource only promoted education *about* the environment (because learners only learn more 'about' the environment and not *in/through* and *for* the environment). They all explained the new concepts with the help of the textbooks. In some cases, learners also made use of the textbooks to do their class activities (see Resources Sections 4.4.1, 4.4.3 and 4.4.7).

Using the textbooks as teaching and learning resources to explain the content of the lessons to the learners promoted education *about* the environment. The lessons' content included the climatic conditions and the type of vegetation in the equatorial rainforest; impacts of HIV and AIDS on education and health sectors; causes and effects of bush encroachment; the importance of trees in the environment; subsistence farming; the importance of the ozone layer; causes and effects of land pollution on tourism and the sustainable use of natural resources (see Content knowledge in Sections 4.4.1- 4.4.8).

Other visual resources were also used. Posters were used by two teachers (T2, in his first and T3 in her second lessons). T2 used a poster on HIV and AIDS symptoms which was given to the learners to study (see Resources in Section 4.4.2). The poster on the importance of trees in the environment was placed on the chalkboard and used to explain the content more clearly to the learners (see Resources in Section 4.4.4). The poster on the processes of subsistence farming was given to the learners for them to identify and discuss the processes shown (see Resources in Section 4.4.5). This promoted education *about* the environment as learners gained more knowledge about the impacts of HIV and AIDS, the importance of trees and the processes of subsistence farming.

Another visual resource used was a world map. This was used by T1. The map was also placed on the chalkboard and used by the learners to show the distribution of equatorial rainforests (see

Resources in Section 4.4.1). This promoted education *about* the environment as learners learned the location of the region in the world.

The chalkboards were used by teachers to write up the main points of the lessons for the learners (see Resources in 4.4.8). This promoted education *about* the environment as it enabled learners to have more notes for future learning 'about' the environment.

Most resources used, such as, textbooks, posters and maps seemed to play a major role in supporting learning activities and in assisting learners to acquire skills, knowledge and understanding *about* the environment. They were also used to mobilize learner's prior knowledge. Teachers explained what was in the posters, textbooks and maps, thus giving learners knowledge *about* the environment. In most of the activities done, learners used textbooks and maps to answer questions (see Resources in Sections in 4.4.2, 4.4.3 and 4.4.5).

5.2.4 Analytical statement 4:

Linking learning to local context encouraged education *in/through* the environment

In the literature review (see Section 2.3), it was discussed that the Geography curriculum emphasizes firsthand experience and suggested that learners should be taken out in the environment to experience the issues discussed in the classroom. These personal experiences in the environment enable reflection and the development of critical awareness and concern (Palmer & Neal, 1994). The Geography curriculum includes environmental issues both in Namibia and the world. This is an indication that the Geography curriculum supports an opportunity of linking content to local context by including local issues. This was demonstrated by two teachers in this study who took their learners outside the classroom for real-life experiences (see Link to local context in sections 4.4.3 and 4.4.4).

These teachers used a field study approach - one of the environmental education approaches discussed by Palmer (1998) (see Section 2.9). The teachers took their learners outside the classroom as they wanted them to have direct contact with the environment and increase their

environmental awareness through experience (see Link to local context in sections 4.4.3 and 4.4.4). This is more likely to promote environmental concern and encourage wise use of the environment, as indicated by Fien (1993) (see Section 2.3).

Taking learners outside the classroom is the best way to let learners know about their environments and linking lessons to the local environment. It can be an exciting learning experience. In this study, learners saw what their environment consists of and got in touch with the real world around them (see Link to local context in Sections 4.4.3 and 4.4.4).

As reported in Chapter 4, learners were taken outside to do observations within the school ground. These provided opportunities for the learners to explore their school context and identify problems in their own environments. They suggested solutions to environmental problems and took actions to improve their environments (see Link to local context in Sections 4.4.3 and 4.4.4).

The other 6 teachers also tried to link their content to local context by giving local examples to their learners. These enabled learners to understand the content as they better linked what was taught in the class with the reality of the environment in which they live and this can enhance the learning process through real life experience (see Link to local context in Sections 4.4.1, 4.4.2, 4.4.3, 4.4.4, 4.4.5 and 4.4.7).

5.2.5 Analytical statement 5:

Education *for* the environment was addressed, but the scope was limited.

In Chapter 2 of this study, it is discussed that education *for* the environment entails the investigation of environmental problems with the intention of resolving them. Palmer (1998:144) affirms that "when pupils are encouraged to explore their personal responses to and relationship with the environment and environmental issues, it is likely that this will help them to develop a personal ethic for the world". This also encourages learners to reflect on their learning and develop the skills to enact what they have learned (see Section 2.3). In their findings, Palmer and

Neal (1994) revealed that successful teaching will involve learners in being educated *for* the environment when they seek solutions to environmental problems within the school and the local area, taking account of conflicting interests (see Section 2.3).

It is discussed in Chapter 2 of this study that education *for* the environment aimed to make people aware of the goals of sustainability. This is to ensure that people have the basics of ecology and that they are able to sustain their surroundings. In this study teachers taught the learners about solutions to environmental problems. They ensured learners understood that solving local problems helped in solving global problems (see Content knowledge in Sections 4.4.1, 4.4.3, 4.4.5, 4.4.7 and 4.4.8).

The study found that one teacher promoted self awareness and challenged the ways in which learners behaved towards the environment and the commitment to care about the environment. This was done as the teacher asked learners to suggest how they could avoid or reduce land pollution in their school grounds. This promoted the ability and will to act towards land pollution as learners suggested solutions such as keeping rubbish in the bins, doing cleaning campaigns in the school and provide boxes for re-cycle and re-use in the classes (see Link to local context in Section 4.4.7).

In Namibia, environmental education is based on a learner-centred approach which represents a democratic style of teaching. The democratic style promotes learning through understanding and practice to empower learning. In this study, teachers taught in a democratic style by drawing on the learners' life experiences and giving them as many tasks as possible, both in groups and individually, to test their existing knowledge and understanding about the content taught. This promoted a learner-centred approach to teaching.

In Chapter 2, it was explained that education *for* the environment supports people to employ sustainability measures and move towards a more sustainable society. In this study, there was no evidence that teachers allowed their learners to act towards the environmental problems. This limited education *for* the environment. It is discussed in Chapter 2 that for quality environmental

learning, learners should get opportunities to take meaningful actions towards environmental problems (see Section 2.2).

In Chapter 2, it was explained that education *for* the environment is the most effective way to help students become empowered and participate actively to build a better environment for all, in the hands of experienced and committed teacher educators (see Section 2.3). However, based on what is discussed in Chapter 2, education *for* the environment is not all about teaching learners solutions to environmental problems. It is also about teaching learners realistic solutions which can empower them and involve them in action taking towards resolving environmental problems.

[Jickling and Spork (1998) argued that the role of educators would be to engage students in ethical issues rather than prescribe a particular set of values. However, in this study, learners were not engaged in ethical issues, instead they were only taught about solutions to the environmental problems. In this way, learners could not become critically aware of how they perceive the world.

Chapter 2 further discussed that the concept of education *for* the environment aims to enable people to make informed decisions, be aware of the goals of sustainability and take actions towards environmental problems (see Section 2.5). In this study, teachers made learners aware of sustainability by teaching them sustainability measures (see teacher and learners interactions in Sections 4.4.1, 4.4.2, 4.4.3, 4.4.5, 4.4.7, 4.4.8). One teacher (T7) and learners suggested an action of cleaning the school ground by picking up litter (see Teacher and learner interaction in Section 4.4.7). This action may have lead to the disappearance of the rubbish in the school. However, the action is incomplete unless the cause of the problem is tackled. The causes of land pollution may be addressed when people stop littering, re-use, re-cycle, and put bins around the school.

Introducing plastic bags which have to be given to every class for collecting litter and an awareness campaign can also reduce land pollution as it involves learners in acting towards solving environmental problems. Involving learners in solving environmental problems engages them in the exploration and resolution of environmental issues. This promotes their participation in suitable and equitable use of resources. In so doing, it builds on education *about* and

in/through the environment to help develop on informed concern for the environment (see Section 2.3).

Actions where the purpose is to influence others to do something to contribute to solving environmental problems in question are indirect environmental actions (Jensen & Schnack, 1997). In this study, a teacher telling learners to keep the school environment clean is an example of indirect environmental action (see Teacher and learner interaction in Section 4.4.5).

Environmental issues discussed in this study such as deforestation can be addressed through exploring alternative sources of energy. Telling people to stop cutting down trees (see Teacher and learner interaction in Section 4.4.4) is not feasible in countries like Namibia. Brown (1992) noted that most of the Namibian population live in rural areas and are directly dependent upon natural resources for their livelihoods. Firewood is the main source of energy and freely available in Namibia. Similarly, Jickling and Spork (1998) maintained that the impact of announcing that you will teach *for* the environment in a community which is heavily resource dependent should be considered. There must always be feasible options, for example, the community may use solar power or wind power instead of firewood, to conserve the forest for future generations.

Active participation in solving environmental problems can empower learners (see Section 4.3.4). If no actions are being taken, learners can be disempowered. In this study, learners were taught about environmental problems such as deforestation, land pollution, and the thinning of the ozone layer. Solutions to these environmental problems such as stopping cutting down trees and planting new ones, putting rubbish in the bin and stopping using CFCs were also explained to the learners (see Teacher and learner interaction in Sections 4.4.4, 4.4.6 and 4.4.7). Hence, teaching these solutions only equipped learners with knowledge *about* the environment, not *for* the environment. Although teachers did not directly involve their learners in solving environmental problems, they all acknowledged the importance of involving learners in action taking in response to environmental problems (see Teacher and learner interaction in Section 4.3.4).

In summary, we can conclude that teachers taught the learners *for* the environment, but the scope was limited. They taught their learners about solutions to environmental problems, learners were not involved in actions towards environmental problems. Education *for* the environment is more than knowing solutions to the environmental problems. It is imperative that learners participate in real world issues in order to develop critical thinking and enable problem solving.

5.2.6 Analytical statement 6:

Teachers used competencies prescribed within the syllabus to structure learning *about, in/through* and *for* the environment.

This study found that the syllabus played a major role in the structure of lesson plans. All intended learner competencies found in the lesson plans were influenced by the syllabus (see Competencies in Section 4.4.1- 4.4.8). This is supported by the Ministry of Education (2005) which states that the lesson planning must reflect the competencies stipulated in the syllabus.

In Chapter 2, it is discussed that competencies can be used and interpreted in different ways (see Section 2.8). This study found that in all of the 8 lessons presented by the teachers, the intended competencies were achieved (see Competencies in Sections 4.4.1, 4.4.2, 4.4.3, 4.4.4 and 4.4.5).

In Lesson 1, learners were able to describe the distribution of the region. They were also able to examine photographs of vegetation in the equatorial rainforest and were able to describe the vegetation in the region (see Competencies in Section 4.4.1). In Lesson 2, learners were able to examine HIV and AIDS symptoms on the poster (see Competencies in Section 4.4.2). In Lesson 3, learners mentioned several causes of bush encroachment such as low rainfall and overgrazing. They were also able to suggest solutions to bush encroachment, such as keeping fewer animals in an area to avoid overgrazing (see Competencies in Section 4.4.3). In Lesson 4, learners carefully observed the vegetation in the school grounds and explained the type of vegetation they saw (see Competencies in Section 4.4.4). In Lesson 5, learners examined and identified the processes of subsistence farming on a poster (see Competencies in Section 4.4.5). In Lesson 6, learners used the sketch to describe the basic features of the three layers of the atmosphere (see Competencies

in Section 4.4.6). In Lesson 7, learners identified land pollution, mentioned the causes and demonstrated knowledge of possible solutions to the problem. They also exhibited behaviour that enabled them to make decisions (see Competencies in Section 4.4.7). In Lesson 8, learners defined natural resources: renewable and non-renewable resources (see Competencies in Section 4.4.8).

Even though teachers used the competencies prescribed in the syllabus, there were cases where teachers added and left out some competencies. In one case, the syllabus competencies were not planned for by teachers but were included in the presentation. The teacher asked learners to evaluate the importance of the ozone layer as one of the features of stratosphere (see Competencies in Section 4.4.6). This promoted education *about* the environment as learners gained an understanding of the importance of the ozone layer and why it has to be protected. This would also enable learners to contribute to environmental management and solve environmental problems.

In two cases, syllabus competencies were planned but were not realized. For example, T5 planned for the learners to apply solutions they were taught to environmental problems in other parts of the world. This however, did not happen (see Competencies in Section 4.4.7). Consequently, teaching *for* the environment was limited and therefore the learners were not able to critically explore how solutions could be applied to similar problems in different parts of the world.

T6 planned to teach about for 'sustainability of natural resources. Nevertheless, he could not explain why resources should be used sustainably. As a result, learners could not show any evidence of reasoning for the sustainable use of natural resources (see Competencies in Section 4.4.8). This limited the potential for education *for* the environment as learners failed to understand the importance of natural resources and why they have to be used sustainably.

5.3. CONCLUSION

In this chapter, I have answered my research question, by discussing what I learned about the incorporation of education *about, in/through* and *for* the environment in the Geography Junior Phase curriculum. It has been noted that the dominant methods and activities used by the teachers supported education *about* the environment. This means that teachers concentrated on question and answer strategy and on activities which promoted factual recall 'about' the environment. Teachers were interested in listening to the learners and encouraged them to participate. They explained new concepts clearly which promoted education *about* the environment. Learning *about* the environment provided students with opportunities to learn *about* the functioning of the natural systems.

It has also been noted that most (5) types of knowledge about the environment were covered in all lessons. One type of knowledge was only covered by 5 teachers.

The study found that a variety of resources were used by the teachers. Their focus of resources and the way they were used exclusively supported education *about* the environment. The way the resources were used influenced the type of learning that took place in the classroom. Most of the resources used were only those that were available in schools such as textbooks and those which were created by teachers themselves such as posters.

Two teachers in this study used the strategy that enabled them to localize their lessons by using the environment as a resource for learning, thus encouraging education *in/through* the environment. Some teachers took their learners outside the classrooms to explore their own environment for real life experience. Other teachers used local examples to simply localise their lessons and make learners understood the content better.

It was noted that most teachers in this study taught their learners *for* the environment by teaching them solutions to environmental problems. However, teachers did not encourage their learners to take action towards environmental problems. This could make some of the solutions suggested unrealistic to the learners.

Teachers used competencies prescribed within the syllabus to structure learning *about, in/through* and *for* the environment. Most of these competencies were realized and promoted education *about* the environment. Other resources were not realized and this thus limited education *for* the environment.

In the next chapter, a summary of the study and recommendations for the effective incorporation of education *about, in/through* and *for* the environment are discussed.

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

6.1 INTRODUCTION

This Chapter provides a brief summary of the research findings in relation to the research question. The main body of this chapter is divided into two sub-sections. The first section revolves around the main conclusions that have been made by the researcher in an attempt to answer the research question and meet the research goals. The second section presents the recommendations for the effective incorporation of education *about, in/through* and *for* the environment in the Namibian Geography Junior Phase curriculum, by drawing on the analytical statements discussed in Chapter 5.

6.2 A SUMMARY OF THE STUDY

My study aimed to understand how teachers incorporate education *about, in/through* and *for* the environment in the teaching of the Geography Junior Phase curriculum. I first consulted a wide range of literature (local and international) on environmental education, environmental learning and education *about, in/through* and *for* the environment, to strengthen my understanding. I then did an analysis of documents, carried out observations and informant semi-structured interviews with Geography teachers in the three schools as outlined in Chapter 4 (see Section 4.2).

From the process, I was able to triangulate data sources, which enabled me to find the relations between the syllabus, textbook and lesson plan content and consistencies in the interview responses. The lesson contents followed that of the syllabus and textbook. However, in a few cases, the content of the syllabus and that of the textbook differed from that of the lesson plan in that some of the details were either added or left out of the lesson plan.

The study has provided an insight into teachers' rationale, intentionality and experiences about education *about, in/through* and *for* the environment. All teachers involved in this study acknowledged the importance of environmental learning in the Geography curriculum. However,

they had no training in environmental education. Lack of resources to provide enough information about the topics was one of the challenges.

The evidence from this study suggests that most teachers used methods and activities that encouraged education *about* the environment. Teaching methods such as question and answer (discussion) and lecture and resources such as textbooks and posters were commonly used by teachers.

Chapter 2 discussed the type of knowledge about the environment. The study highlighted that most types of knowledge were covered in all lessons presented in this study.

It was also highlighted in this study that a variety of teaching and learning resources were used by the 8 teachers. The focus and the methods used exclusively supported education *about* the environment. The way the resources were used influenced the type of learning that took place in the teachers' classrooms.

The study found that teachers linked their lessons to local context which encouraged education *in/through* the environment. Some teachers did this by taking their learners outside the classrooms to the surrounding environment for direct real life experiences and others by giving local examples to the learners.

It is highlighted in this study that teachers made efforts to educate their learners *for* the environment by teaching solutions to the environmental problems. However Chapter 2 discussed that education for the environment requires learners to be actively involved in the exploration and resolutions of environmental issues and problems. This is the reason why the Geography syllabus prescribes some activities and competencies which call for learners' actions in response to environmental problems. Teachers in this study followed the syllabus to structure learning *about, in/through* and *for* the environment, even though in some cases, they did not make used of all the syllabus activities and competencies.

As discussed in Chapter 2 of this study, quality education comes with relevance, meaningfulness and reasonableness. The Chapter further discussed that for quality environmental learning, learners should get opportunities to take meaningful actions towards environmental problems. Quality environmental learning helps learners to address real and meaningful issues in their surrounding environment. In this study, however, only two teachers took learners outside the classrooms for direct experiences. This enabled learners to interact with the environment, make sense of environmental issues and propose meaningful solutions.

6.3 THE SIGNIFICANCE OF THE FINDINGS

The findings of this study are significant when considered in the light of growing environmental issues and problems in Namibia as well as in the world. Teachers' incorporation of education *about, in/through* and *for* the environment is one of the important findings in this study. Teachers incorporated education *about, in/through* and *for* the environment using different teaching methods and resources. Using different teaching methods helps promote thinking and decision-making skills as well as foster different viewpoints and opinions.

In Namibia, environmental education is offered across the curriculum. This means that environmental learning is included in all the school subjects. The findings of this study are therefore important to all teachers and educators as they will help them in the selection of methods and resources for the effective teaching of environmental learning in their curriculum.

This study recommends support for teachers to implement environmental learning in the Geography curriculum. This can be done through workshops and training in environmental education (see Section 6.2.2).

6.4 LIMITATION OF THE STUDY

Learners' work was part of my original proposed document analysis; however, I did not get any piece of marked learner's work from the teachers. This limited my analysis as the number of documents analyzed was brought to three (3) documents, which were textbooks, syllabus and

lesson plans. Analyzing learners' work could have added quality to my study as it could have given me more on how learners related to the environmental focus.

6.5 RECOMMENDATIONS

In Namibia, before independence, environmental education was not part of the curriculum. However, after independence in 1990, environmental education became part of the Namibian school curriculum. It emerged as a cross curricula theme and was prioritized by the government. The government sees the integration of the three forms of environmental education (education *about, in/through* and *for* the environment) as important. In support of this and from the analytical statements presented in Chapter 5, the following recommendations were drawn that would facilitate the effective incorporation of education *about, in/through* and *for* the environment in the curriculum and more especially in the Geography Junior Phase curriculum. These recommendations were supported by the descriptions provided in Chapter 5. The recommendations are intended for Geography teachers as well as all teachers whose subjects include environmental learning in their curriculum.

6.5.1 Environmental education coordinator in schools

The evidence from this study indicated that teachers had enough information in presenting their lessons on environmental learning. However, they wanted to explore more on their topics. This was cause for concern as teachers lacked knowledge, skills and understanding of environmental learning, especially on teaching *in/through* and *for* the environment, since they used their own previous experiences on the field.

To help these teachers, the study recommends that environmental education coordinators be appointed in all schools in Namibia. The coordinators can assist, where necessary, teachers with getting the necessary information on environmental learning to cover their topics. They can encourage and monitor the implementation of environmental focus within the Geography Junior Phase school curriculum to promote the effective selection and use of environmental resources in the schools.

The National Association for Environmental Education (NAEE) in Palmer and Neal (1994:10) maintained that "it is difficult to see how environmental education can be delivered unless the school has a member of staff responsible for its co-ordination". Geography teachers can be appointed as environmental education coordinators since the subject includes much of the environmental education content.

The coordinators can among others:

- arrange programmes for special environmental days such as Arbour day and World environmental day
- establish an environmental club
- start an environmental action group to tackle environmental problems in the school and the surrounding community
- make sure learners are involved in environmental programmes in the community
- make sure learners together with the teachers do projects and investigations within the school

These roles provide teachers as well as learners with opportunities to engage in environmental learning within and beyond the classrooms. With increased awareness, knowledge, skills and attitudes, teachers and learners can become more environmentally literate and act competently to build a sustainable future. Environmentally literate teachers can explore more on their topics for the effective delivery of education *about, in/through* and *for* the environment.

6.5.2 Teaching methods to support education *in/through* and *for* the environment.

The evidence of this study suggests that the methods used by the teachers in this study to incorporated environmental learning in their teaching encouraged education *about* the environment. Teachers paid more attention to question and answer and lecture methods. There was little evidence to show that the methods were used to promote education *in/through* and *for* the environment.

This study recommends that further attention is paid to the ways in which teachers teach *in/through* and *for* the environment, by considering the learner's context and experiences. For learners to make connections between abstract concepts in the classroom, and reality outside the classroom, teachers can use the school ground and other local areas. Introducing learners to local areas such as school ground can help them to develop understanding of how similar principles can be applied to other areas. They will learn that the actions and decisions at local level can have meaning in a global context.

For fieldwork to work effectively, teachers need support from the subject Advisory Teachers (AT) and the Ministry of Education at large. Teachers need physical support in terms of expertise provided to acquire confidence in fieldwork techniques. This strategy is also most successful when it is implemented in a system that encourages collaboration among teachers and learners.

The study further recommends that teachers use appropriate methods to achieve the required competencies. When selecting the methods it is advisable that teachers always consider the intended competencies in the syllabus to make sure that they are realized.

6.5.3 Better provision and enhanced use of resources to support education *about, in/through* and *for* the environment

In this study, most of the teachers seemed to use textbooks more than other resources. Textbooks were also used by the learners to prepare for class discussions and to provide the necessary background such as maps, pictures and diagrams. The use of textbooks as a resource in this study promoted education *about* the environment as it enabled learners to learn more 'about' the environment.

To promote education *in/through* the environment in teaching Geography, the study recommends the need for materials such as flipcharts for learners to use in the field, worksheets for them to fill in, videos to record information and cameras to capture information. These materials can be used while in the field, thus bringing another sense into the learning experience. In class, the visual materials multiply the learners' level of understanding of the content presented and

reinforce the message, clarify points, and create excitement. The materials are also good for teacher-learner interaction in both small and large groups as they can provide emphasis to whatever is being said.

To promote education *for* the environment in the teaching of Geography, the study recommends the need for resources to support sustainability practices such as instructions on how to plant trees, recycle used products and use resources in a sustainable way.

It is further recommended that teachers should be encouraged to use materials in ways that involve and encourage learners. This is more effective than just to talk to the learners in promoting education *in/through* and *for* the environment.

This study also recommends that teachers should encourage the learners to make use of the libraries. The study further recommends that there is a need to support the teachers in developing the ability to select appropriate resources/materials as well as design their own materials and critically reflect on their use. It is also recommended that a variety of printed materials and teaching machines such as videos and computers should be used.

The study further recommends Advisory Teachers to work with teachers to manage the use of available resources more effectively and to make sure that adequate resources are available. In this case, Advisory Teachers can request NIED to ensure that the latest, up-dated resources are in the school libraries to be used by both teachers and learners for study purposes.

6.5.4 Teaching *for* the environment in a realistic way

The study found that teachers taught their learners *for* the environment, but in a superficial and unrealistic way. Teachers taught their learners about solutions to the environmental problems. For example, T1 told learners that solutions to deforestation are, among others, to stop cutting down trees or cut one tree and plant another two. This had limited empowerment potential for learners as it does not engage them in tree planting. To make the solutions realistic, learners could have been involved in planting new trees.

This study therefore recommends the involvement of learners in problem solving. Learners need to be involved in investigating environmental problems and making decisions and exploring solutions to these problems. Teachers also need to be supported to encourage learners' views and to engage more critically with learners' views. This will enable them to become responsible citizens and decision makers in future.

6.6 RECOMMENDATIONS FOR FURTHER RESEARCH

The interviews revealed that there were not enough resources to provide information on environmental learning. What and how teachers get and use these resources is another area for further research.

6.7 CONCLUSION

This study explored the incorporation of education *about, in/through* and *for* the environment in the Namibian Geography Junior Phase curriculum. It reviewed the methods, activities and resources used by the teachers to foster environmental learning in the curriculum. The study also tested the teachers' intentionality and experiences in planning and implementing environmental learning content in the Geography curriculum. Based on the discussions in Chapter 5, it can be concluded that teachers involved in this study incorporated education *about, in/through* and *for* the environment.

The study revealed that:

- The methods and activities used by the teachers in fostering environmental learning in the curriculum predominantly supported education *about* the environment.
- Teachers covered most of the types of knowledge *about* the environment in their teaching.
- Teachers used resources in a way that exclusively supported education *about* the environment.
- Teachers linked their learning to local context through real life experiences.
- Education *for* the environment was addressed, but the scope was limited.

- Teachers used the prescribed syllabus to structure learning *about, in/through* and *for* the environment.

The research found that the content and competencies in the syllabus, textbook and teachers' lesson plans had a close resemblance. There was a correlation between what learners were expected to learn/know and what they actually learned, which indicates that competencies were achieved as expected in the syllabus.

As the schools involved in this study represent only 3 schools in the region, I am hoping that the findings and recommendations of this study will inform teachers and Advisory Teachers as well as the Ministry of Education.

REFERENCES

Ahmedabad Declaration. (2005). *Education for Sustainable Future Conference.* India: Ahmedabad.

Bednar, A.K., Cunningham, D., Duffy, T. M., & Perry, J. D. (1992). *Constructivism and the technology of instruction: A conversation.* New Jersey: Lawrence Erlbaum Association.

Bennett, D.B. (1989). Four steps to evaluate environmental education learning experiences. *Journal of Environmental Education,* 20(2), 14-21.

Blight, S., Sautter, R., Sibly, J., & Smith, R. (1990). *Our common futures: Pathways for environmental education. Australia:* National Library of Australia.

Bones, B. (1994). *Getting started: A guide to bringing environmental education into your curriculum.* Washington: The National Environmental Education and Training foundation.

Bonn Declaration. (2009). *UNESCO world conference of sustainable development.* Germany: Bonn.

Borman, S. (2006). *Environmental education: Maintaining the quality of life and sustainable Development.*

Bornman, G.M. (1997). Environmental education and the curriculum. *Educare,* 26(9), 57- 67.

Brown, C. J. (1992). *Namibia's Green Plan.* Windhoek: Ministry of Environment and Tourism.

Burton, N., Brundette, M., & Jones, M. (2000). *Doing your education research project.* London: SAGE.

C.A.P.E. (nd.). *Environment in the curriculum.* Howick: Share-Net.

Cantrell, D.C. (1993). *Alternative paradigms in environmental education research perspective: The interpretive perspective.* Troy Ohio: NAAEE.

Cohen, L., Manion, L., & Morrison, K. (2007). *Research methods in education* (6th ed.) London: Routledge Taylor & Francis Group.

Connole, H. (1998). *The research enterprise: In research methodologies in education.* Geelong: Deakin University.

Douglas, R., Feltn, S., Van Rhyn, T., Morrison, K., & Baas, A. (2007). *Geography in context* Namibia: Longman.

Duminy, A.J., Dreyer, H.J., & Steyn, P.D.G. (1990). *Education for student teachers 1.* Cape Town: Maskew Miller Longman.

Du Preez, E. (2007). *The landscape of qualitative research: theories and issues.* Califonia: SAGE.

Enviroteach. (1995). *Tools of the trade, skills and technology for environmental education in Namibia.* Swakopmund: Enviroteach and Ministry of Education.

Fien, J. (1993). *Education for the environment: Critical curriculum theorizing and environmental education.* Australia: Deakin University.

Fien, J. (1998). *Environmental education: A pathway to sustainability.* Australia: Deakin University.

Fien, J., & Gough, A. (1996). *Environmental education. Studying society and the environment: A handbook for teachers.* Melbourne: Machmillan Education Australia.

Gandhi, M. (2007). *4th Conference on Environmental Education.* India: Ahmedabad.

Gayfold, C. (1991). Environmental education: A question of emphasis in the school curriculum: *Cambridge Journal of Education,* 10(3), 3-9.

Hale, M. (1993). *Ecology in education.* Cambridge: Cambridge University Press.

Huckle, J. (1998). *Environmental education and sustainability: A review from critical theory in environmental education.* Deakin: Deakin University.

Irwin, P. (2007). *EEASA in a changing world: An historical review at 25 years.* South Africa: EEASA.

Janse van Rensburg, E. (1996). *Environmental education: An overview and issues to consider in the Eastern Cape.* Rhodes University: Murray & Roberts Chair of Environmental Education.

Janse van Rensberg, E. (2001). *An orientation to research.* Grahamstown: Rhodes University Environmental Education Unit.

Jensen, B.B., & Schnack, K. (1997). The action competence approach in environmental education. *Journal of environmental education research,* 3(2), 163-178.

Jickling, B., & Spork, H. (1998). Education for the environment: A critique. *Journal of environmental education research,* 4(3), 19-309.

Jickling, B., & Wals A.E.J. (2008). Globalization and environmental education: Looking beyond sustainable development. *Journal for Curriculum Studies,* 40(1). 3-7.

Johnson, B., Patton, A., Scott, S., Daar, C., Petric, R., Smith, M., & Burter, A. (2004). *Educational research: Quantitative and qualitative and mixed approaches.* Boston: Allyn and Bacon.

Jonassen. D.H. (1999). Constructivism teaching and learning methods. *Journal of constructivist teaching,* 85(2), 50-55.

Ken, B. (1991). The Greening of our school. [Electronic version]. *Journal of environmental education,* 44(2), 7-8.

Lotz-Sisitka, H. (2006). *ESD Practice in Southern Africa.* Howick: SADC REEP.

Lotz-Sisitka, H. (2010). *Education for sustainable development and retention: unraveling a research agenda.* South Africa: Rhodes University.

Martin, C.G., & Wheeler, K. (1975). *Insights in environmental education.* Edinburg: Oliver and Boyd.

McMillan, J.H., & Schumacher, S. (2006). *Research in education: Evidence based enquiry* (6th ed.). United States of America: Pearson Education.

Merriam, S.B. (1998). *Case study research in education: A qualitative approach.* San Franscisco: Jossey-Bass Publishers.

Mertens, D.M. (1998). *Research methods in Education and Psychology:* Integrating diversity with qualitative or quantitative approach. London: SAGE.

Murdoch, K. (1993). *Ideas for environmental education in the elementary classroom.* Australia: International Thomson Publishing Company.

Mweti, I., & Van Wyk, H. (2005). *Development Studies*: Module 1. Cambridge: University Press.

Namibia Environmental Education Network. (1999). Environmental Education Policy for Namibia. Windhoek: NEEN.

Namibia. Ministry of Education. (1990). *Namibia Constitution.* Namibia: Windhoek.

Namibia. Environmental Education Network. (1992). *Environmental education policy for Namibia.* Windhoek: NEEN.

Namibia. Ministry of Education. (1993). *Towards Education for All.* Namibia: Gamsberg Machmillan.

Namibia. Ministry of Education. (1995). *An environmental resource book for Namibian teachers.* Swakopmund: Enviroteach.

Namibia. Ministry of Education. (1996). *Pilot curriculum guide for Formal Basic Education.* Okahandja: NIED.

Namibia. Ministry of Education. (1998). *Pilot curriculum guide for Formal Senior Secondary School.* Okahandja: NIED.

Namibia. Environmental Education Network. (1999). *Environmental education policy for Namibia.* Windhoek. NEEN.

Namibia. Ministry of Education. (1999). *Supplement to the pilot curriculum guide for Formal Basic Education.* Okahandja: NIED.

Namibia. Ministry of Education. (2001). *In-Service Basic Education Teacher's Diploma:* Module 5. Okahandja: NIED.

Namibia. Ministry of Education. (2004). *Social Sciences Education Module 4: Designing Learning experiences in Social Sciences.* Namibia: NIED.

Namibia. Ministry of Environment and Tourism. (2004). *An environmental education policy for Namibia.* Okahandja: NIED.

Namibia. Ministry of Education. (2005). *Curriculum guidelines for environmental learning in Namibia.* Okahandja: NIED.

Namibia. Ministry of Education. (2005). *Guidelines for teachers on planning lessons.* Okahandja: NIED.

Namibia. Ministry of Education. (2007). *Namibia Junior Secondary Phase: Geography Syllabus.* Okahandja: NIED.

Neal, P., & Palmer, J. (1994). The Handbook of environmental education. London: Routledge.

Palmer, J.A. (1998). *Environmental education in the 21st Century:* theory, practice, progress and promise. New York: Routledge.

Palmer, J., & Neal, P. (1990). *Environmental education in Primary School.* Oxford: Basil Blackwell.

Palmer, J., & Neal P. (1994). *The Handbook of environmental education.* London: Routledge.

Palmer, J.A. (1998). *Environmental education in the 21st Century: Theory, practice, progress and promise.* New York: Routledge.

Rosenburg, E. (2009). *Teacher Education workbook for environmental and sustainability education.* Grahamstown: Rhodes University Environmental Education and Sustainability Unit.

Schunk, D.H. (2004). Continuing the controversy about reward and intrinsic motivation, *Journal of educational research,* 49(2). 532 – 534.

Scott , W. (2009). Judging the effectiveness of sustainable school: A brief exploration of issues. *Journal of Education for Sustainable Development,* 3(1), 33.

Stone, J.M. (1989). Preparing teachers to become involved as environmental educators: *Contemporary Education,* 60(3), 159 – 162.

Strydom, H. (2002). *The pilot study. In: A S.De Vos (Ed.) Research at grass roots: For the Social Sciences and human service professions.* Pretoria: Van Schaik Publishers.

Tilbury, D., & Williams, M. (1997). *Teaching and learning Geography.* New York: Routledge.

The Global Forum for Environmental Education. (1994). *Global Network of Teachers and Students.* 5(1), 15

Tveitdal, S. (2005). *UNEP Strategy for environmental education and training: A strategy and action planning for the Decade 2005-2014.* Kenya: Nairobi.

UNCED (1992). Agenda 21.Riode Janiero: UNCED.

UNESCO. (1987). Final report: *Intergovernmental Conference on Environmental Education,* Paris: UNESCO.

UNESCO/UNEP. (1987). *International strategy for action in the field of environmental education and training for the 1990's.* Paris: UNESCO.

UNESCO-UNEP. (1978). *The Tbilisi Declaration.* Connect III (I).

UNESCO. (1978). Final Report. *Intergovernmental Conference on Environmental Education,* Paris: UNESCO.

UNESCO. (2009). *World Conference on Education for Sustainable Development.* Germany: UNESCO.

WCED (World Commission of Environment and Development (1987). Our Common Future [The Brundtland Report]. Oxford: OUP.

Woods, P. (2003). Environmental education for a sustainable future: Formal schooling. *Curriculum leadership Journal,* 20(21), 33.

Yin, R.K. (1994). *Case study research: Design and methods.* London: SAGE.

Yin, R.K. (2003). *Case study research design and methods (6th ed.).* London: SAGE.

APPENDICES

APPENDIX 1

Observation Schedule

School:

Grade:

Date:

Time:

Provisional Title: **Education about, in/through and for the environment in the Junior Phase Geography Curriculum.**

Content (Topic)	
Activities done by teacher and learners. How? (methods)	
How are these activities linked to the curriculum?	
Material used (resources)	
How were the materials used by the teacher? (methods)	
How were the materials used by the learners? (methods)	
Classroom context (class size, language use, teacher-learner relationship)	
General positive observations difficulties observed	

APPENDIX 2

Interview schedule:

Provisional Title: **Education about, in/through and for the environment in the Junior Phase Geography Curriculum.**

Introduction

1. Have you attended any workshop/ training on environmental education? What strategies were you introduced to help you teach environmental topics more effectively in Geography? How do you use these in your classroom?
2. What do you think is the role of Geography in learners' lives?
3. What environmental issues do you think are relevant in learner's lives?
4. What challenges do you think learners are experiencing in environmental learning in Geography?
5. How did you link these to learners' lives?

Education *about* the environment

1. What did you want the learners to know about the environment?
2. Which method did you use? Why did you use this method? How did it go?
3. Can you think of ways to improve this?
4. Did you have enough information to cover this topic?
6. Is there anything else you would like to explore about the topic you taught?

Education *in/through* the environment

Set 1 (for teachers who taught *through* the environment)

1. Explain how you introduced your learners to local issues.
2. Why did you do it in this way? How did it go?
3. Can you think of ways to improve it?

Set 2 (for teachers who did not teach *through* the environment)

1. Do you think that linking local issues e.g. through fieldtrip or practical hands on activities or newspaper clippings can benefit the lesson? If yes, How? If not, Why not?
2. Do you think it is important to link the local context? If yes, how does this help learners to understand the content better? If not, why?

For all teachers in set 1 and 2

3. Does your curriculum support such opportunities? How?
4. How can you use the school grounds and surrounding community to teach environmental learning?
5. Are there any constraints in using these opportunities?
6. Did you experience any difficulties in presenting your lesson?
7. Can you think of ways of improving the lesson?

Education *for* the environment

1. Do you think teaching environmental learning in Geography will make a difference in learner's lives? Why? Why Not?
2. Do you think this lesson has made a difference in learners' lives? Why? Why not? If so, what methods and strategies did you use to support this?
3. How important is it that learners know about solutions to environmental problems? Does the curriculum support this?
4. How important is it for learners to be involved in action taking in response to environmental issues? Does the curriculum support this?
5. Can learners become disempowered through unrealistic solutions? If so, what other alternatives are there?

APPENDIX 3

Interview Transcript

School: **(S1)**

Teacher: **(T1)**

Date: 02 June 2010

Time: **12:00**

Provisional title: **Education about, in/through and for the environment in the Namibian Junior Phase Geography Curriculum.**

Introduction

Evelyne: Have you attended any workshop/ training on environmental education? What strategies were you introduced to help you teach environmental topics more effectively in Geography? How do you use these in your classroom?
Satheba: No

Evelyne: What do you think is the role of Geography in learners' lives?
Satheba: Well. Mhh, Geography plays a huge role in learner's lives because their whole well being is in Geography. It is a phenomenon that they all have to be taught in schools as to unlock them to the reality of the world they live in.

Evelyne: What environmental issues do you think are relevant in learner's lives?
Satheba: Pollution, as young children might not be aware that throwing gums is pollution to the environment. Deforestation, I think they should be aware of the role they can play simply by planting trees around their playground. Global warming, is also relevant because the entire world is affected by this, so as learners themselves by knowing this, they can even inform their parents who are ignorant about this because everyone has a role to play when it comes to global warming. In short, it changes the environment in which learners live.

Evelyne: What challenges do you think learners are experiencing in environmental learning in Geography?
Satheba: Lack of teaching materials especially the visual materials. I think if there were more visual materials, learners will be enjoying Geography because they learn about environmental problems which are not in our countries like equatorial rainforests. The world they live in is the verge of being destroyed, meaning their lives are affected. The other challenge can be the concept development, because it all start when the concept is clear, if the concept is not clear; it cannot open up for the learners.

Evelyne: How did you link these to learners' lives?
Satheba: I brought it home. I gave local examples which they can see around the environment.

Education *about* the environment

Evelyne: What did you want the learners to know about the environment?
Satheba: I wanted my learners to know about the diversity of the environment that exist in the world. My learners only know about tropical savannah and desert, because most of the areas in Namibia are covered by savannah and we do not have equatorial rainforests.

Evelyne: Which method did you use? Why did you use this method? How did it go?
Satheba: Teachers exposition - for the teacher to come in and comprehend or help where learners do not understand. I used discussion method for different experiences to be shared by the learners because I

know learners have different experiences. I used question and answer method to test learners' prior knowledge. The lesson went well because learners participated.

Evelyne: Can you think of ways to improve this?
Satheba: Yes, include more visual materials such as videos so that they see what is happening while discussing. The discussion could have gone smooth because learners can relate to what we were talking.

Evelyne: Did you have enough information to cover this topic?
Satheba: Yes, I had enough information because I used different books. I collected information from different books (3 books).

Evelyne: Is there anything else you would like to explore about the topic you taught?
Satheba: Yes, making more learning experiential- I could have involved more of a dialogue or role play so that learners can get a sense of place to start their learning.

Education *in/ through* the environment

Set 2
Evelyne: Do you think that linking local issues e.g. through fieldtrip or practical hands on activities or newspaper clipping can benefit the lesson? If yes, How? If not, Why not?
Satheba: Yes, because learners become aware of the reality that surround them. It is good to start with local issues may a topic shown on TV or a fire broke somewhere. It is important that they understand the environmental issues of their own country first before those of other countries. Experiential learning

Evelyne: Do you think is important to link the local context? If yes, how does this help learners to understand the content better? If not, why?
Satheba: Yes, before learners learn about the environmental issues of the country, it is vital that they know about their local issues. If a learner learns how deforestation taking place at their own environment, they will be able to relate to that.

For both set 1 and 2

Evelyne: Does your curriculum support such opportunities? How?
Satheba: Yes, because it include lessons/topics on the environmental issues in Namibia and the world. Things like erosion, floods are in the curriculum and that makes a room to accommodate local issues.

Evelyne: How can you use the school ground and surrounding community to teach environmental learning?
Satheba: Learners can be given time to come to the environmental and they have to identify different types of plants they have and do not have and why they do not have that.

Evelyne: Are there any constrains in using these opportunities?
Satheba: Yes, some places are very for like deserts. Places are not available within learners' environment. It is difficult to take them there. If the government can provide money for learners to go on trip, they could have learned better.

Evelyne: Did you experience any difficulties in presenting your lesson?
Satheba: Yes, by the end of the lesson I thought some learners did not comprehend what they have learned. I could even say, there was a need to repeat the lesson because I did not attain the objectives. There were no concrete visual materials that I could use for the learners to really understand.

Evelyne: Can you think of ways of improving the lesson?
Satheba: Yes, I love video. The use of video can give learners a sense of place to relate to a place where they have never been before.

Education *for* the environment

Evelyne: Do you think teaching environmental learning in Geography will make a difference in learner's lives? Why? Why Not?

Satheba: Yes. It builds within them skills such as appreciation of their environment, to value what they have and to preserve it.

Evelyne: Do you think this lesson has made a difference in learners' lives? Why? Why not? If so, what methods and strategies did you use to support this?

Satheba: I cannot really be sure if it had made a difference in their lives because I can say it might have or it might not have. I depend on how learners understand the lesson. Some learners will not show any difference because they did not understand at the end of the day; so it is a two way thing.

Evelyne: How important is that learners know about solutions to environmental problems? Does the curriculum support this?

Satheba: Some solutions they can do them themselves. This will enable learners to make contributions in reducing environmental problems. Like as I said earlier, an environmental problem such as deforestation, if learners know that a solution to deforestation is planting more trees then they can do it themselves, either at home or at school. Yes, there are topics on solutions to pollution, global warming, and soil erosion in the syllabus, so it does accommodate this.

Evelyne: How important is for learners to be involved in action taking in response to environmental issues? Does the curriculum support this?

Satheba: Very important, it makes learners be more appreciative and it is one way of working towards environmental problems. Learners will be aware of what is happening within their own environment. Taking action for learners is another way of working towards solutions to the environmental problems.

Evelyne: Can learners become disempowered through unrealistic solutions? If so, what other alternatives are there?

Satheba: Yes, It is no use teaching learners unlocked and unrealistic solutions where they are going to live in a different world. The alternative is just better to find solutions that are realistic to them as they grow up, they will be striving to attainable realistic solutions rather than unrealistic solutions.

Evelyne: Are there any other comments?

Satheba: No

Thank you very much for your time.

APPENDIX 4

AM1: Interviews

Summary of main issues obtained from the interviews which were conducted in three schools in Oshana Education Region. Six interviews were conducted, two in school 1, one in school two and three in school 3. Interviewees were teachers whose lessons were observed.

Table: Main issues obtained from interview schedule

Categories	Comments	Respondents
1. Workshop attended on environmental education	No I attended workshops related, but not exactly on EE	I1, I2, I3, I4, I5 I6
2. Role of Geography in learners lives	Enable learners to take care and sustain the environment. Unlock learners to the reality of the world. Enable learners to apply the content to other subject (multi-subject). Allows learners to interact with the environment.	I2, I3, I5 I1 I4 I6
3. Environmental issues relevant to learners lives	Pollution • If the land, water and air are polluted, it will be unhygienic to the learners as this will affect their future. Deforestation Global warming • This can change the environment in which learners live. Soil erosion Desertification	I1, I4 I3 I1, I4, I6 I5 I1 I3, I6 I6
4. Challenges faced in environmental learning in Geography	Lack of textbooks. Learners separate reality from their learning. Learners not exposed to different environment Learners do not practice what they learn.	I1 I5, I6 I2, I3 I4
5. Importance of teaching learners about the environment	To preserve, conserve and sustain the environment. To know the environment better To know about the diversity of the environment	I2, I3, I5, I6 I4 I1
6. Availability of information used to teach about the environment	No enough information. Enough information was available.	I2 I1, I3, I4, I5, I6
7. Importance of teaching learners in/through the environment	To link what learners learn in the classroom with what they see outside. Teaching, involving and make sure the learner understand is very important	I2, I3 I4

8. Importance of linking the lesson content to the local context	Learners become aware of reality that surrounds them. Learners understand the content better.	I1 I4, I5, I6
9. Curriculum support on linking lessons to local context	Yes Yes Yes • It includes environmental issues in Namibia such as soil erosion, flood, which makes a room to accommodate local issues. • It is stipulated in the syllabus, just to help learners understand the content better. • By including local projects and field trips in its content. No • It is up to the teacher to find ways on how learners can learn better.	I1 I2 I3 I4 I6 I5
10. Constrains in using such opportunities	Time • No enough time to explore and link all lessons to local context. • Taking learners for a day trip will affect other subjects. Basic competencies too theoretical than practical Distance (some places are not available within learner's environments and it is very difficult to take learners there). No constraints	 I2, I3 I5 I2 I1 I4
11. Importance of teaching learners for the environment	It will enable learners to make contributions in reducing and solving environmental problems. Learners learn to be responsible in the future. Learners have so many ideas to contribute.	I1 I3, I4, I5 I4
12. Importance of involving learners in action taking towards environmental problems	It makes learners to be more appreciative and it is one way of working towards solutions to environmental problems. Learners learn to be responsible in the future. Learners have so many ideas to contribute.	I1 I3, I5, I6 I4
Teaching methods used in presenting lessons	Discussion method • For different experiences to be shared • It allows learners to interact and learn more from each other. • It helps them to engage themselves into the lesson. Lecture method • It was a matter of informing them about the	I2, I3, I4 I1 I6 I6 I5

	topic.	
	Question and answer method	I1, I2, I5, I6
	• To see whether learners have captured what I was teaching	I3
	• I wanted them to give their view on what pollution is.	I4
	Discovery method	I1
	• To link learners into real life situation	I3
	Textbook method	
	• To explain the content clearly to the learners	I1, I2, I3, I4, I5
	Teacher exposition	
	• For the teacher to come in and help where learners do not understand.	I1
	Explanatory method	
	• To explain the content more clearly to the learners.	I1

APPENDIX 5

AM2: Document Analysis and Lesson observation

The analytical memo below is a summary of main issues emerged from the documents which were analyzed and observations which were conducted in three schools in Oshana Education Region. Three documents were analyzed: syllabi, textbooks and lesson plans. Eight observations were conducted, three in school 1, two in school 2 and three in school 3. Observed were Geography teachers for Junior Phase.

Topic: Equatorial Rainforests

Data Source	Syllabus	Textbook 1	Lesson Plan 1	Classroom Implementation 1
Code	(S)	(TB1)	(LP1)	
Content	Distribution of equatorial rainforests on a map	Distribution of equatorial rainforests in the world	Distribution of equatorial rainforests	Distribution of equatorial rainforests
	Climate of the region	The climate in an equatorial rainforests	Climate in equatorial rainforests	Climate in equatorial rainforests
		Types of rainfall occurs in the region	Types of rainfall occurs in the region	Convection rainfall
	Vegetation types of the region	Natural vegetation in the region	Vegetation types of the region	Vegetation types of the region
	Human activities and their effects on the natural environment e.g. deforestation	Human activities in equatorial rainforests: - Timber and cash crops - Subsistence farming	Human activities in the region Effects of human activities on the environment in the region e.g. deforestation	Human activities in the region Effects of human activities on the environment in the region e.g. deforestation- Timber and cash crops - Subsistence farming
		Environmental concerns	Solutions to deforestation	Solutions to deforestation
Activities	"Learners can use practical activities to collect information from secondary sources on the climatic region as assigned to groups. For example,	**Activity 1** Identifying equatorial rainforests on the map **Activity 2**	**Activity 1 (drawn on activity 1)** Learners have to study the map and answer questions on equatorial rainforests (map	Learners did activity 1 as prescribed by the textbook. In addition, the teacher placed a map of Africa on the chalkboard and called one learner to come and show the line of Equator. She indicated to the

	learners need to show on a map as per syllabus specification. Learners can collect and explain the climatic data of temperature, rainfall, photographs depicting vegetation types and human activities. Investigate issues such as deforestation in an equatorial rainforest, by focusing on causes, environmental effects, and possible solutions. Peer teaching involving presentation, with reference to the climatic region can be used" p.g 13	Investigating climate in an equatorial rainforest region **Activity 3** Explain how the convection currents result in convection rain **Activity 4** Examining an equatorial rainforest **Activity 5** Investigate weather and work in the region.	reading). **Activity 2 (drawn on activity 2)** Learners have to find a map of Gabon in the textbook and look at the mean monthly temperatures and rainfall and answer the questions. **Activity 3 (drawn on activity 5)** Learners have to look at the weather and work calendar table, which shows how climate affects yam production in Warri, Southern Nigeria and answer the questions. **Activity 4** Description of human activities and their impacts on the environment.	learners that countries along the line such as Congo, Gabon and Uganda are part of the region. Explain the climatic condition of the region that it is hot and wet (with convection rainfall) throughout the year and the type of vegetation found in the region as tall up to 45metres and evergreen. The teacher instructed one learner to draw the layer of vegetation found in the region. Learners did activity 2 as prescribed by the textbook. The teacher explains the human activities (what people do in the region to survive) such as subsistence farming, plantation and timber. Impacts of these activities on the environment such as soil erosion and deforestation were also explained. She was reading the content from the textbook. Learners did not do activity 3 as planned by the teacher.
Competencies	"Learners should be able to indicate distribution of equatorial rainforests on the map Describe the climate by using climatic graphs of temperature and rainfall Recognize most vegetation types from photographs and sketches. Describe human activities and their effects on the natural environment (e.g. deforestation)". p.g 13	Interpretation of maps Explain geographical process Investigating climate Examining information about the region Investigating weather	Learners should be able to indicate distribution of equatorial rainforests on the map Describe the climate by using climatic graphs of temperature and rainfall Recognize most vegetation types from photographs and sketches. Describe human activities and their effects on the natural	Thinking and participation Interpretation of graphs and maps Listening to the information on human activities Drawing

			environment (e.g. deforestation)	
Resources	Texts, pictures, diagrams and statistics	Map of the world and of Gabon. Figure showing layers of vegetation in an equatorial rainforests. Diagrams showing how convection rain forms and falls. Table shows mean monthly temperature and rainfall for Libreville, Gabon and another table shows how climate affects yam production in Warri, southern Nigeria	Geography Textbook Map of the world in the textbook Chalkboard	The textbook was used by the teacher to explain the lesson content and by learners to do the activities. The map was used by the teacher to show the distribution of the region. The chalkboard was used by the teacher to write the main points of the lesson and by one learner to draw the layer of vegetation found in the region. Diagrams and tables were used by learners to complete the activities.
Teacher-Learner discussion/participation (Questions and Answers)				The teacher asks learners what equatorial rainforest is. Learners answered that one of the major region south of Sahara. She further asks learners why the region is called a rainforests. Learners answered that because it receives rainfall throughout the year. The teacher asks learners to describe the climatic condition of the region. Learner answered hot and wet. She further asks learners to mention the type of rainfall received in the region. Learners answers include: convection rainfall (formed when the air heats up and rises). One learner asks the teacher why the

				vegetation in the area is tall. The teacher answered that there is high rainfall and enough sunlight. Another learner asks the instrument used to measure the height of the plants and whether we have the same type of plants in Namibia. The teacher was not sure about the answers.
Teacher-learner relationships				Appropriate use of non-verbal communication clues Show interest in listening to learners Communicate with different groups in the class. Learners were free to ask and answer questions and to give their opinions. Engage learners in meaningful learning
Language used				English language used. Some few learners experience difficulties in expressing themselves when asking and answering questions, however, the majority were able to express themselves.
Class size				36

Topic: The impacts of HIV and AIDS on education and health sectors in Namibia

	Syllabus	Textbook 2	Lesson Plan 2	Classroom Implementation 2
Code	(S)	(TB2)	(LP2)	
Content	HIV and AIDS	HIV and AIDS	Difference between HIV and AIDs	HIV and AIDS (difference)
	The impacts of HIV and AIDS pandemic on education and health sectors in Namibia	The impacts of HIV and AIDS on population - Education	Impacts of HIV and AIDS on education Three parties of education :Parents,	Impacts of HIV and AIDS on education. Three parties of education :Parents, Teachers and Learners

			Teachers and Learners	
			Government responsibilities	Government responsibilities
		Impacts of HIV and AIDS on - Health	Impacts of HIV and AIDS on health sectors	.Impacts of HIV and AIDS on health sectors
			Government responsibilities	Government responsibilities
			Prevention measures on HIV and AIDS	Prevention measures on HIV and AIDS
Activities		**Activity 1** Examine how HIV and AIDS affect populations for different countries	**Activity 1** Learners to investigate the impacts caused by HIV and AIDS on both education and health sectors in Namibia.	The teacher explains to the learners that HIV changes or affects people's lives whether socially or economically, it is therefore regarded as an environmental issue. People may not interact effectively within the environment because of the disease. He further explains the impacts of HIV and AIDS on education by explaining the three parties of education which are parents, teachers and learners. He also explains the impacts of HIV and AIDS on health sectors as, nurses will become sick and unable to work, more money will be needed for medication, lack of health workers, more hospitals and clinics will be needed. Learners did the activity as planned by the teacher.
Competencies	"Learners should be able to investigate the impacts of HIV and AIDS pandemic on education and health sectors in Namibia". p.g 32	Examine graphs and tables	Learners should be able to investigate the impacts of HIV and AIDS pandemic on education and health sectors in Namibia	Thinking and participation Listening to the information about the impacts of HIV and AIDS on education and health sectors in Namibia.

Resources		**Figures** showing the impacts of AIDS on the population structure of Namibia, AIDS orphans in number and percentages and the relationship between HIV and AIDS and education. **Table** shows how birth and death rate affect populations of different countries	Geography textbook A poster on HIV and AIDS infection Chalkboard	Geography textbook was used to explain the content to the learners A poster on HIV and AIDS infection was used as a source of information by learners to understand more on AIDS infection. Chalkboard was used to write the main points of the lesson explained by the teacher.
Teacher-learner discussion/participation (Question and Answers)				Teacher asks learners to differentiate between HIV and AIDS. One learner answered that HIV is a virus that causes AIDS and AIDS is a disease caused by the virus. The teacher asked learners to explain how HIV and AIDS changed the lifestyle of their relatives and friends or for anyone they know. Learners' answers included: most children become orphans as they lost their parents, children spend much time looking after their parents instead of going to school. Asks learners as to what responsibility the government will have as a result of HIV and AID impacts. Learners' answers included: lack of qualified teachers, more orphans to be taken care of, decrease in population, lack of workforce and spending more money on medication. Teacher asks learners to give the effects HIV and AIDS cause on teachers. Learner answer included, teachers become weak to work and lose

				their jobs, and learners will stay without teachers which lead to poor education. Teacher asks learners to mention measures to be taken to stop the spread of HIV and AIDS. Learners answers include use condoms, say no to sex, abstain, be faithful, get tested and awareness campaign.
Teacher-learner relationships				Appropriate use of non-verbal communication clues Show interest in listening to learners. Has shown confidence and enthusiasm in the subject and learners were very motivated in answering questions.
Language used				English language used All learners were able to express themselves when answering questions. However, they had difficulties in pronouncing words such as immune, syndrome, deficiency.
Class size				41 learners

Topic: Bush encroachment

	Syllabus	Textbook 3	Lesson Plan 3	Lesson Implementation 3
Code	(S)	(TB3)	(LP3)	
Content		What is bush encroachment?	What is bush encroachment?	What is bush encroachment?
		Bush encroachment areas in Namibia	Observing a grassy and bushy areas within and around the school ground	Observing a grassy and bushy areas within and around the school ground
	Causes of bush encroachment	Causes of bush encroachment - Human causes - Natural causes	Causes of bush encroachment	Causes of bush encroachment
	Effects of bush encroachment	Effects of bush encroachment	Effects of bush encroachment	Effects of bush encroachment
		Some solutions to bush	Solutions to bush encroachment	Solutions to bush encroachment

		encroachment		
Activities	Select a particular site near the school. discuss the use of features, problems and possible solutions	**Activity 1** Describe how the disappearance of grass and increase of bush can affect the underground water. **Activity 2** Explain how bush encroachment affects the biodiversity of and area.	**Activity 1** An explanation of the influence bush encroachment has on the environment **Activity 2 (drawn from activity 2)** Learners to summarize the causes, effects and solutions to bush encroachment	The teacher explains to the learners that bush encroachment is an environmental issue because it does not support any environment. The influence bush encroachment has on the environment included pollution of the land. She then took learners outside the classroom to go and observe two areas, bushy and grassland. He explains the main causes of bush encroachment including periodical floods and wild animals as also natural causes. He finally explains the effects of bush encroachment. Learners to do the activity planned by the teacher as homework.
Competencies	"Learners should be able to describe the causes and effects of bush encroachment" p.g 38	Describe how bush encroachment affects underground water. Explaining the information on bush encroachment	Learners should be able to describe the causes and effects of bush encroachment	Thinking and participation Listening to the information about causes, effects and solutions to bush encroachment. Observation of an area where bush encroachment occurs.
Resources		A map of Namibia indicates areas where bush encroachment occurs. Figures show some plants that cause bush encroachment and areas with and without bush encroachment.	Geography Textbooks	Geography textbook was used to explain the content to the learners.
Teacher-learner				Teacher asks learners to define bush encroachment. One learner answered

discussion/participation (Question and Answers)				that it is a place where we have a lot of bushes. The teacher asks learners what causes the area to be the way it is. Learners' responses include little rainfall and poor soil. She further asks them to give some natural causes of bush encroachment. Learner's respondents include acid rain, climate change and poor rainfall.
Teacher-learner relationships				Appropriate use of non-verbal communication clues Show interest in listening to learners. High learners participation which show active learning Interact and listen to the learners
Language used				English language used Few learners experience difficulties in expressing themselves, however the majority were able to express themselves.
Class size				41 learners

Topic: Vegetation

	Syllabus	Textbook 1	Lesson Plan 4	Classroom Implementation 4
Code	(S)	(TB1)	(LP4)	
Content	Natural vegetation	Natural vegetation	Natural vegetation	Vegetation as a natural resource
			Observing natural vegetation within the school ground	Difference between natural vegetation and man-made
	Importance of Natural vegetation	Importance of natural vegetation	Importance of trees (vegetation)	Importance of trees
		Human and natural activities which destroy natural vegetation	Human activities which damage the vegetation -Deforestation	Human activities which damage the vegetation -Deforestation
		Consequences of these activities on	Consequences of this activity	Causes and consequences of these activities

		the environment		
	Why and how vegetation can be sustainably utilized		Solutions to this activity	Solutions to the problem
Activities		**Activity 1** Describe the natural vegetation in your area. **Activity 2** Describe how natural vegetation been damaged or replaced by human activities **Activity 3** What can be done to protect areas of natural vegetation from harm **Activity 4** Think of all the different uses of trees and make a list of these uses	**Activity 1** Identification of vegetation in the school ground **Activity 2 (drawn from activity 4)** Learners to discuss how they understand by: Trees act as the lungs on the world, in their groups.	The teacher took learners outside the classroom to go and identify the natural vegetation and those grown by people around the school environment. She explains how human activities damage the natural vegetation by using an example of farming where people need to clear the land. Teacher wrote: Trees act as lungs on the world on the chalkboard and ask learners to give their understanding on this in their groups. Learners did the activity as planned by the teacher.
Competencies	"Learners should be able to explain how vegetation can be sustainably utilized". p.g 19	Describing the information (natural vegetation) Thinking and participation	Learners should be able to explain how vegetation can be sustainably utilized.	Thinking and participation Listening Observation
Resources		Figure shows natural vegetation in the wetter northern parts of Namibia.	Geography textbook A poster on the importance of trees	Geography textbook was used to explain the contents to the learners A poster was used to explain the importance of trees to the learners.
Teacher-learner discussion/participation (Questio				The teacher asks learners the type of vegetation they have seen outside. Learners' answers include marula and Mopani as natural and quvas and palm trees and planted. She further asks learners to give the importance of trees.

n and Answers)				Learner's answers include shelter, oxygen, food, wood, shade and fuel. Ask learners to discuss how people can use the natural vegetation sustainably. Learners' responses include not cutting down trees, plant more trees and recycle the used products.
Teacher-learner relations hips				Fair to learners Use non- violent handling of discipline problems Communicate with different groups in the class. However, the teacher had difficulties in managing the class.
Languag e used				English language used Most learners experience difficulties in expressing themselves when answering questions.
Class size				38 learners

Topic: Subsistence farming

	Syllabus	Textbook 2	Lesson Plan 5	Classroom Implementation 5
Code	(S)	(TB2)	(LP5)	
Content	Subsistence Farming	Subsistence farming	Subsistence farming	What is subsistence farming
	Example of the type of production (subsistence farming) in Namibia	Processes of subsistence farming -Cultivating -Harvesting -Winnowing -Storage	Processes of subsistence farming -Clear the land -Ploughing -Cultivating -Harvesting -Winnowing -Storage	Processes of subsistence farming -Clear the land -Ploughing -Cultivating -Harvesting -Winnowing -Storage
		Type of products from subsistence farming and how they are sold at informal markets	Effects of subsistence farming on the environment -Deforestation	Effects of subsistence farming on the environment -Population pressure -Deforestation -Overgrazing

			-Soil erosion	-Soil erosion
			Solutions -Plant more trees -Crop rotation -Discourage monoculture	Solutions -Plant more trees -Crop rotation -Discourage monoculture
Activities			**Activity 1** Describing the photographs. **Activity 2** Explaining the information. **Activity 3** Learners to study the figure on several factors lead to desertification and answer given questions. **Activity 4** Learners to study another figure on the causes of deforestation and answer given questions.	The teacher distributed copies of photographs to the learners for them to discuss what is happening in the photographs in their groups. The teacher explains the processes of land cultivation on subsistence farming. She further explains how population explosion affects the environment. Gave learners a class work on actors lead to desertification and causes and solutions to deforestation (activity 1 and 2) Learners did the activities 1 and 2 as planned by the teacher.
Competencies	"Learners should be able to describe at least one representative example of subsistence farming". p.g 33	Interpretation of photographs Describing the information	Learners should be able to describe at least one representative example of subsistence farming	Thinking and participation Listening to the Interpretation of photographs Problem solving
Resources		Photographs show how *mahangu* is typically cultivated by subsistence farmers. Photographs show	Geography textbook and a poster on the processes of subsistence farming	Geography textbook and a poster on the processes of subsistence farming

		products, surplus grain and meat sold at informal markets.		
Teacher-learner discussion/participation (Question and Answers)				
Teacher-learner relationships				Fair to learners Use non- violent handling of discipline problems Communicate with different groups in the class. High learner's participation.
Language used				English language used. Most learners experienced difficulties in expressing themselves when answering questions.
Class size				32 learners

Topic: The Earth's atmosphere

	Syllabus	Textbook 3	Lesson Plan 6	Classroom Implementation 6
Code	(S)	(TB3)	(LP6)	
Content	Lower three layers of the atmosphere	Layers of the atmosphere	Layers of the atmosphere	Layers of the atmosphere
	Basic features of each layer	Features of the three layers of the atmosphere	Features of troposphere Features of the stratosphere Ozone layer Feature of the mesosphere	Features: Troposphere Stratosphere and ozone layer Mesosphere

Activities		**Activity 1** Identify the layers shown on the diagram. **Activity 2** Describe the importance of ozone layer.	Learners to do a puzzle on the layers of the atmosphere	The teacher instructed learners to go to page 36 in the textbook where they find a sketch on the layers of atmosphere and study it. She explains to the learners that ozone is a layer that protects us from the UV rays from the sun. She then gave copies of a puzzle on the layers of the atmosphere to be completed as homework. Learners to answer the puzzle as expected by the teacher
Competencies	"Learners should be able to indicate on the sketch the lower three layers of the atmosphere and describe the basic features of each". p.g 26	Interpretation of diagrams Describing of information on ozone layer.	Learners should be able to indicate on the sketch the lower three layers of the atmosphere and describe the basic features of each.	Listening Interpretation of photographs Problem solving
Resources		A sketch showing the three layers of the atmosphere and diagram shows the layer of ozone	Geography textbook	Geography textbook used by the teacher to explain the content to the learners.
Teacher-learner discussion/participation (Question and Answers)				Asks learners to describe the features of the troposphere. Learners answers included: nearest to the earth, consists of air, stretch up to 12km above the surface. Asks learners to describe the features of the stratosphere. Learners' answers included: layer above the troposphere, stretches at above 12-50km above the earth's surface, contain ozone. Asks learners what will happen if there was no ozone layer. Learners were not able to answer this question. The teacher emphasized that there could be skin cancer and eye problems. Asks learners to describe the features of

				mesosphere layer. Learners' answers included: Coldest layer up to -100c, stretches about 50-80km above the earth surface.
Teacher-learner relations hips				Appropriate use of non-verbal communication clues Show interest in listening to learners Fair to learners and support learner-centred paradigm.
Languag e used				English language used. Learners were able to express themselves when answering questions.
Class size				43 learners

Topic: Land pollution

	Syllabus	Textbook 3	Lesson Plan 7	Classroom Implementation 7
Code	(S)	(TB3)	(LP7)	
Content	Describe pollution of the land	Pollution: Land pollution	What is land pollution?	What is pollution?
		Causes of land pollution	Causes of land pollution	Causes of land pollution
		Effects of land pollution	Effects of land pollution	Effects of land pollution
		Solutions to land pollution	Solutions to land pollution	Solutions to land pollution
Activities	**Activity 1** Select a particular site near the school. discuss the use of features, problems and possible solutions	**Activity 1** Explain how you can avoid land pollution within your school environment.	Learners were asked to come up with ideas of how they can avoid land pollution within the school environment.	Teacher explains the causes, effects and solution to land pollution. Learners to come up with ideas as expected by the teacher.
Compete ncies	"Learners should be able to: Describe pollution of the land Suggest solutions for problems from their own vicinity e.g. population education, environmental	Explaining how to avoid land pollution.	Learners should be able to: Describe pollution of the land Suggest solutions for problems from their own vicinity	Thinking and participation Listening to information on the causes, effects and solution to land pollution.

	education sustainable production, etc. Transfer and apply this knowledge to the solution of problems in other areas". p.g 39		e.g. population education, environmental education sustainable production, etc. Transfer and apply this knowledge to the solution of problems in other areas	
Resources			Geography textbook	Geography textbook was used by the teacher to explain the content to the learners.
Teacher-learner discussion/participation (Question and Answers)				Teacher asks learners to give the negative effects of land pollution especially on tourism which is one the main contribution to the Namibian economy. Learners answer include: environment will look ugly, environment will be spoiled that it will discourage tourists not to come back to Namibia anymore. Teacher asks learners to think of some solutions to land pollution. Learners answer include: recycle paper, re-use products and stop throwing used products on the ground. The teacher asks learners as to how they can avoid land pollution in their own school. Learners responses include: put all rubbish in the bin, do cleaning campaign in the school.
Teacher-learner relationships				Appropriate use of non-verbal communication clues Show interest in listening to learners Communicate with different groups in the class
Language used				English language used. Most of the learners were able to express themselves in responding to questions posed by the teacher.

Class size				43 learners

Topic: Natural Resources

	Syllabus	Textbook 1	Lesson Plan 8	Classroom Implementation 8
Code	(S)	(TB1)	(LP8)	
Content	Define resources	Natural Resources	What are natural resources?	What are natural resources?
	Renewable and non-renewable resources	Renewable and non-renewable resources	Renewable and non-renewable resources	Renewable and non-renewable resources
	Examples of renewable and non-renewable resources	Examples on renewable and non-renewable resources	Examples of renewable and non-renewable resources	Examples of renewable and non-renewable resources
	How and why renewable and non-renewable resources can be sustainably utilized.	Sustainable use of natural resources	Sustainable use of natural resources	Sustainable use of natural resources
Activities			**Activity 1** Differentiate the resources given into renewable and non-renewable resources. **Activity 2** Explanation on sustainable use of natural resources	Learners did the activity as given by the teacher. Teacher told learners to differentiate the resources into renewable and non-renewable resources in their groups and report back. Teacher explains how natural resources can be used sustainably, so that they can last longer for the future generations.
Competencies	Learners should be able to: Define renewable and non-renewable resources Explain why and how renewable and non-renewable can be sustainably used.		Learners should be able to: Define renewable and non-renewable resources Explain why and how renewable and non-renewable can be sustainably used.	Thinking and participation Listening to information on the sustainable use of natural resources.
Resource		Figure on natural	Geography	Geography textbook used by the teacher

s		resources (trees, oil, plants, water, soil, animals and fresh air).	textbook Chalkboard	to explain the content to the learners. Chalkboard was used to write the main points of the lesson.
Teacher-learner discussion/participation (Question and Answers)				Teacher asks learners to define natural resources. Learners answers include: something natural, something not man-made something that is useful. Teacher stressed that natural resources are the gifts of nature. Teacher further asks learners to give any of the natural resources they know. Learner's respondents include: vegetation, water, minerals. Teacher asks learners to differentiate between renewable and non-renewable resources. Learner's answers include: renewable – do not get finished and non-renewable cannot be replaced after used up.
Teacher-learner relationships				Appropriate use of non-verbal communication clues Show interest in listening to learners Communicate with different groups in the class
Language used				English language used Most of the learners were able to expressing themselves in answering questions.
Class size				42 learners

APPENDIX 6

Request for permission to conduct research

30 March 2010

Mr. Haipanda
The Deputy Director
Oshana Education Region
Private Bag 2020
Ondangwa

Dear Sir

Subject: Permission to conduct an educational research project in three schools in Oshana Education Region

I am an M. Ed. (Environmental Education) student at Rhodes University. I am intending to conduct an educational research for my thesis in order to fulfil the M. Ed requirements. The envisaged visits to schools are from the first to the second week of April 2010. The aim of my research project is to investigate how education about, in/through and for the environment is reflected in the Junior Phase Geography Curriculum.

I hoped that the findings of this study may benefit all teachers in Namibia with the information, knowledge and skills on how environmental education is reflected in the Geography curriculum in particular and the school curriculum in general.

It is further hoped that the study may reveal valuable information on how Geography teachers plan and implement the curriculum and how the curriculum influences the education about, in/through and for the environment. The collection of data will be done through document analysis, interviews and observations. The study focused on Geography Junior teachers only.

My supervisor is:
Ingrid Schudel
(Tel: 046-6038389)
(Fax: 046-6361495)

I would be very grateful if favourable consideration is made at your earliest possible convenience.

Yours sincerely

Eveline O. Anyolo

M. Ed. Student: Faculty of Education: Environmental Education and Sustainable Unit
Rhodes University
(Tel: 065-230001)
(Fax: 065-230006)

APPENDIX 7

Approval of conducting research from the Ministry of Education (MoE)

REPUBLIC OF NAMIBIA

MINISTRY OF EDUCATION

PROGRAMMES AND QUALITY ASSURANCE

Tel: 264 61 2933200
Fax: 264 61 2933922
E-mail: mshimbo@mec.gov.na
Enquiries: MN Shimhopilent

Private Bag 13186
Windhoek
NAMIBIA

26 March 2010

File: 11/2/1

Ms Eveline O. Anyolo
Rhodes University
RSA

Dear Ms E. O. Anyolo

RE: REQUEST TO CONDUCT A RESEARCH IN THREE (3) SCHOOLS IN OSHANA REGION

Your letter dated 25 March 2010 requesting permission to conduct a research at there (3) junior secondary schools in Oshana Region, has reference.

Kindly be informed that the Ministry does not have any objection to your request to carry out a research project at those three schools.

However, you are advised to contact the Regional Education Office for permission to go into the schools. It is also advisable to identify the schools you intend to visit before approaching the regional office, for them to know the schools you have selected and to inform them accordingly.

Kindly note also that the Ministry would appreciate it highly, if you could present it with a copy of your research findings for our information.

By copy of this letter the regional director is made aware of your request.

Yours faithfully

MINISTRY OF EDUCATION Office of the Permanent Secretary 29 MAR 2010

I V Amukwa
PERMANENT SECRETARY

cc: Regional Director: **Oshana Education Region**

APPENDIX 8

Approval of conducting research from Oshana Education Region

REPUBLIC OF NAMIBIA

MINISTRY OF EDUCATION: OSHANA REGION

Tel: (065) 229800
Fax: (065) 229833 / 229834
Email— imanuelaipanda@hotmail.com

Private Bag 5518
Oshakati
NAMIBIA

Enq: Immanuel S. Aipanda
Ref: 12/2/6/1

Principals of Schools:
Gabriel Taapopi SSS
Ongwediva JSS
Mwadhina gwaNembenge SSS

Permission to conduct research in schools.

Permission is hereby granted to Ms Eveline O Anyolo to conduct research in the three schools on the following conditions:
The conducting of the research should not interrupt the teaching programmes of the schools. The participation in the research is on a voluntary basis.

Kindly accord her your usual assistance.

Yours sincerely

21/04/10

Mrs Dutte N Shinyemba
Regional Director

APPENDIX 9

Letter to the participants

16 March 2010

Dear Grade 8-10 Geography teachers

I am registered for a Master's degree with the Environmental Education and Sustainability Unit at Rhodes University. To qualify for my Master's degree, I am required to write a research report on a topic that is linked to an aspect of work undertaken in the course component of the Master's programme. I have chosen to focus on education about, in/through and for the environment in the Geography Junior Phase curriculum. The aim of my research project is to investigate how education *about, in/through* and *for* the environment reflected in the Junior Phase Geography Curriculum.

I will attempt to answer the following questions:

- What contents and activities in syllabi and textbooks support education about, in/through and for the environment?
- What methods do teachers use to foster education about, in/through and for the environment?
- How methods, content, activities and resources are implemented in the classroom context?
- What are teachers' perspectives on context, rationale and intentions in lesson planning and lesson plan implementation
- How Geography curriculum influences education *about, in/through* and *for* the environment.

Please complete the attached consent forms if you are willing to assist me with this research:

(a) by participating in an interview with me at a time that is convenient to you

(b) by allowing the interviews to be tape-recorded for later transcription and use in the research project

(c) by allowing observations to be video-recorded and photographs to be taken to illustrate evidence of classroom practice.

Yours sincerely

Evelyne Anyolo

APPENDIX 10

Consent Form 1

I hereby agree to participate in an interview with Evelyne Anyolo, I understand that she will be enquiring my context, rationale and intentions in lesson planning and lesson implementation of education about, in/through and for the environment in the Geography Junior Phase Curriculum.

Signed: ---------- Date: ----------

APPENDIX 11

Consent Form 2

Evelyne Anyolo is hereby given permission to record interviews and observations conducted with me as well to look at my lesson preparation books, learners' work, syllabi and textbooks as part of the process of her data collection for a research report that she will be writing for the completion of her Master's degree. Photographs will also be taken during observations. I understand that transcripts will be made of the interview and that the extracts from these may be used in the final report while photographs taken during observations will be used to illustrate evidence of classroom practice.

Signed: ---------- Date: ----------