THE INCORPORATION OF ENVIRONMENTAL EDUCATION FOR SUSTAINABILITY IN THE NAMIBIAN COLLEGES OF EDUCATION

BY

ALEX TUBAWENE KANYIMBA

submitted in accordance with the requirements

for the degree of

DOCTOR OF EDUCATION

in the subject

DIDACTICS

at the

UNIVERSITY OF SOUTH AFRICA

PROMOTER: PROF I.A. COETZER

NOVEMBER 2009

SUMMARY

The study explores the incorporation of Environmental Education (EE) for sustainability in the Namibian Colleges of Education. The thrust is held in this study because of the view that the incorporation of EE promotes sustainable development. Cross-curricular teaching is the preferred model for the incorporation of EE in the Namibian Colleges of Education because it brings all teacher educators to contribute to the teaching of environmental education themes just as sustainable development requires all players to incorporate its principles in core operations of institutions.

The study explores the global environment crisis, the environmental degradation in Africa in general and Namibia in particular. Education is seen as an instrument that could be used to address the environmental problems that affect the ability of the ecosystem to regulate climate, to provide resources and to support natural and human life in the broader environment. The study presented the EE goals such as the ecological foundation, the conceptual awareness: issues and values, investigation and evaluation as well as the environmental action, training and application. The study explores theoretical perspectives for the incorporation of EE, theories of modern environmentalism and theories of sustainability as well as policies that were undertaken in Namibia to incorporate EE in the Namibian Colleges of Education.

The methodology of research is both quantitative and qualitative and is rooted in the classical and grounded theory approaches to research. The documentation of data and the questionnaire were used as techniques and tools to collect both direct and indirect data.

It emerged from the findings of the study that the ecological foundation and the conceptual awareness subgoals are part of EE teaching while the investigation

and evaluation as well as the environmental action, training and application subgoals are not part of EE teaching in the Namibian Colleges of Education. The findings of the study reveal that teacher educators in the Namibian Colleges of Education have a variety of understandings and perceptions about the incorporation of EE in the Namibian Colleges of Education. The findings also show that the barriers that affect the incorporation of EE in the Namibian Colleges of Education are institutional, dispositional and situational. The recommendations of the study support the clarification of the concept of cross-curricular teaching in light of the emerging paradigm of sustainable development. They also promote the re-orientation of the administration, the curriculum and teacher educator attitudes in the Namibian Colleges of Education.

Key concepts

Environmental education, sustainability education, outdoor education, ecology education, nature education, environmental learning, sustainable development, curriculum development, education for sustainable development, teacher education and Namibian Colleges of Education

Acknowledgments

I would like to express my sincere gratitude to all colleagues and family members who helped me during this study. In particular I would like to especially thank the following for their support and encouragement

I would like to thank my promoter, Professor I.A. Coetzer for his academic guidance, patience and support during the last two (2) years because he instilled confidence and ability that enabled me to complete this study. I would like to mention that my studies were on the verge of collapse but Professor I. A Coetzer put it back on the road. Thank you very much.

I would like to thank Professor Diane Ashton at the University of Namibia (UNAM) for her comments on the use of language to interpret the data in chapter five (5). I would also like to thank Dr. Likando Gilbert at UNAM for his comments on the chi-square test. My appreciation also goes to Ms. Muteka Anna from UNAM's Language Centre and Ms. Bennet Nora (Retired teacher educator) for reading through the final version of this thesis. I would also like to thank Ms. Muenjo Gift at UNAM' Office of the Pro-Vice Chancellor: Academic Affairs and Research, for helping me with the electronic formatting of the figures and tables.

I would like to thank my employer, UNAM, for supporting me financially during the past five (5) years. It is through this support that I was able to register and even travel to South Africa to meet my promoter and around the country in order to gather much needed data for the study.

I would like to thank the following librarians for helping me to get hold of sources for the study. Firstly, Ms. MM Van Zyl, the subject Librarian at the University of South Africa (UNISA) for her continued support and willingness to provide me with the data base for the literature review. Secondly, Mr. Vincent Muyombo, a

senior library assistant at UNAM for helping me to get hold of literature sources in the UNAM Library.

I would like to thank the colleagues in the Namibian Colleges of Education, for cooperating with me and enabling me to collect data. I also wish to thank Naita Kamho of the Namibian Labour Resource and Research Institute (LARRI) for helping me with data analysis.

Last but not least, I would like to thank my family, wife and children for their support and understanding during the writing of this thesis.

List of abbreviations and acronyms

BETD - Basic Education Teacher Diploma
CA- Conceptual Awareness
CBD - The Convention on Biological Diversity
CITES- The Convention for the International Trade in Endangered Species of Wild Fauna and Flora
CO_{2-} Carbon Dioxide
CONFITEA IV- Fourth International Conference on Adult Education
CONFITEA V- Fifth International Conference on Adult Education
DESD- Decade of Education for Sustainable Development
DC- District Columbia
DRC- Democratic Republic of Congo
EA- Environmental Action
EF- Ecological Foundation
EE- Environmental Education
EPA- The Environmental Protection Agency
ESD- Education for Sustainable Development
ETP- Education Theory and Practice
FCCC- Framework Convention on Climate Change

GDRC- Global Development Research Center
HIV/ AIDS- Human Immune Virus/ Acquired Immune Deficiency Syndrome
IE- Investigation and Evaluation
IEEP- International Environmental Education Programme
INSET- In-service Teacher Education
IUCN- International Union for Conservation of Nature and Natural Resources
LGA- Local Government Authority
MBEC - Ministry of Basic Education and Culture
MEC- Ministry of Education and Culture
MET- Ministry of Environment and Tourism
MWCT- Ministry of Wildlife, Conservation and Tourism
NaDEET- Namib Desert Environmental Education Trust
NARREC- Namibia Animal Rehabilitation Research and Education Centre
NEEC- Namibian Environmental Education Certificate
NEEN- Namibian Environmental Education Network
NEST- Nigerian Environmental study/ Action Team
NGOs- Non- Governmental Organizations
NIED- National Institute of Educational Development
PCEE- Pennsylvania Center for Environmental Education
PoN- Polytechnic of Namibia
PRESET- Pre-service Teacher Training
RME- Religious and Moral Education
SADC- Southern African Development Community
SD- Sustainable Development
SEEN- Supporting Environmental Education in Namibia
SEI- Stockholm Environment Institute
SG- Sustainable Growth
SL- Sustainable Living
SLD- Sustainable Livelihood Development
SLE- Second Language Education

SPSS- Special Package for Social Scientists

SRAP- Sub-regional Action Programme to Combat Desertification in Southern Africa

TV- Television

UN- United Nations

UNFPO- United Nations Food and Population Organisation

UNCED - United Nation's Commission on Environment and Development

UNAM- University of Namibia

UNISA- University of South Africa

UNEP- United Nations Environment Programme

UNESCO- United Nations Educational, Social and Cultural Organization

USSR- Union of Soviet Socialist Republic

US- United States

WWF- World Wide Fund for Nature

WSSD- World Summit on Sustainable Development

List of Figures

List of Tables

Declaration **Student no 3241- 880- 9**

I declare that **The Incorporation of Environmental Education for Sustainability in the Namibian Colleges of Education** is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

_____

Signature 30 November 2009

Mr. A.T. KANYIMBA DATE

D.ED THESIS

Alex Kanyimba
[2009]
Promoter
PROF I.A. Coetzer

Table of Contents

CHAPTER ONE

ORIENTATION

1.1. INTRODUCTION

The purpose of this chapter is to provide an orientation to the study. It highlights the background of the study and presents the statement of the problem, aim, objectives and hypothesis of the study. Furthermore, this chapter explains the research methodology, limitations, delimitations and the programme of the study.

1.2. BACKGROUND

This section unfolds the background of the study. Emphasis is on the global environmental crisis, the environmental degradation in Africa and the environmental problems in Namibia. Efforts to respond to these environmental crises, degradation and problems shall also be briefly unfolded.

1.2.1 The global environmental crisis

Since the end of the Second World War 'there have been accelerating increases in the consumption of both renewable and non-renewable resources" (Reid, 1995: 4). In both the developing and developed world, the demand for renewable and non-renewable natural resources resulted in the environmental crisis that is "generally global" (Subramanian, 2002: V). The population growth and the high rates of per capita resource use are key factors in determining the environmental crisis (Tyller-Miller, 2002: 11-12). Some of the environmental issues that occur globally include deforestation, global warming, climate change, population growth, depletion of fish stocks, destruction of coral reefs, ozone layer depletion, loss of biological diversity, soil erosion, pollution, green house effect, acid rain, desertification, water degradation, destruction of forests, and the disposal of toxic and hazardous waste (Kemp, 1994: 37- 188; Moyo, O'Keefe & Sill 1993: 5-332; Arms, 1994: 32; and Aplin, Mitchel, Cleugh, Pitman & Rich, 1995: 50- 270).

These environmental issues have economic and social impacts on the lives of people (Talbot in Botkin, Caswell, Estes & Orio, 1989: 25). For example, the US Department of Commerce closed two large portions of the Georges Bank because of over fishing that depleted the stock of Cod, Haddock and Yellowtail fish resulting in the loss of thousands of jobs (Raven & Berg, 2004: 9).

Since 1960, record has been kept around the world about the human made efforts meant to avert the global environmental crisis. For example, Boulding (1966:1-2) in his article titled ***'****The Economics of the Coming Spaceship Earth'* gave a distinction between the 'open earth' and the 'closed earth'. He equated the 'open earth' to a 'cowboy economy' that has characterized development after the Second World War and is symbolic of the illimitable plains, reckless, exploitative and violent behavior of open societies as opposed to the 'closed earth' or 'spacemen economy' in which the earth has become a single spaceship without unlimited reservoirs of anything. It is maintained that the dichotomy between these two types of economies becomes apparent in the attitude towards consumption of natural resources. Accordingly, the 'cowboy economy' views consumption and production as the ideal objectives. On the other hand, the 'spacemen economy' measures success by the degree to which resources strike a balance between the natural resources and human needs.

The environmental consciousness movement also witnessed the publication of the report titled '*Limits to Growth'* at the club of Rome in 1972. This report outlined the possible link between global economic growth and natural resources scarcity. Furthermore, 1972 also witnessed the publication of the book by Barbara Ward & Rene Dubos '*Only One Earth'* that also stressed the importance of environmental protection and sustained satisfaction of human needs. The publication of the book described the concerns that led to the 1972 United Nations Conference on the Human Environment in Stockholm (Hardoy, Mitlin & Satterthwaite (1992:173).

A number of International conferences were convened to address the global environmental issues. These include the 1972 Stockholm Conference already alluded to; the Belgrade Charter (1975); The Tbilisi Declaration (1977); Environmental Education in the Light of the Tbilisi Conference (1977); World Conservation Congress (1980); World Conference on Education for all (1990); the

Earth Summit (1992); State of the World Report (1997); United Nations Environment Programme (UNEP) Report, Nairobi (1997); Earth Summit (1997); The International Thessalonika Conference on Environment and Public Awareness for Sustainability (1997) and the Earth Summit (2002). In all the international conferences mentioned above, the nature, scope, essence and place of Environmental Education (EE) have been considered as one of the methods of responding to the global environmental problems (Dreyer, 1996: 72).

Because the scope, essence and nature of EE as a cross-curricular approach to education were recognized at the international conferences, there are numerous international institutions that were established to support EE. These institutions stand out because they raised the global incorporation of EE (Neal & Palmer 1994:12). Some of the institutions that stand out in support of the incorporation of EE are the United Nations Educational, Scientific and Cultural Organisation (UNESCO, 1949); the International Environmental Education Programme (IEEP, 1951); the International Union for Conservation of Nature and Natural Resources (IUCN, 1960); the World Wide Fund for Nature (WWF, 1961); the Environmental Protection Agency (EPA, 1970) and United Nations Environmental Programme (UNEP, 1972).

Despite the above developments and institutions which address the environmental crises through the incorporation of EE, there is consensus that the present scientific and philosophic framework is not adequate to deal with the global environmental crises (Talbot in Caswell, Estes & Orio, 1989: 25). This view is seemingly shared by other authors such as Spork, (1992: 147); Lane, Wilke, Champeau & Sivek, (1995: 36); Gayford, (1998: 101) and Clover, (2000: 213). In these sources the authors justify the need for the incorporation of EE as an educational process that prepares citizens in all countries of the world to contribute towards solving the environmental crises in their surroundings.

1.2.2 Environmental degradation in Africa

Africa is the second largest continent in terms of land area (UNEP: 2000: 52). It has nearly 670 million inhabitants and occupies a total surface area of approximately 30.218.000 km² (Compton's Encyclopedia, 2000: 112).

Africa also experiences the environmental degradation that affects the international community directly or indirectly. The Nigerian Environmental Study/ Action Team (1991: 47- 129) and sources such as Acar (1993: 25), Moyo, O'Keefe & Sill (1993: 5-332) and UNEP (2000: 60-65) mention some of the major environmental problems contributing to degradation in the African continent. They include bush fires, over fishing, soil erosion, poaching of wild animals in game reserves, declining biodiversity and marine resources, disposal of toxic and hazardous waste, deforestation, desertification, the effects of acid rain, water scarcity, polluted water, poor air quality, population growth surpassing national resources, urbanisation, and domestic animals outstripping the land's carrying capacity.

The destruction of forests and woodland areas in Africa continues to contribute to the environmental degradation. Accordingly, Africa lost its forest cover at an annual rate of 0.7 percent. Ninety percent of the population depends on firewood and other biomass for energy. Production and consumption of firewood and charcoal doubled between 1970 and 1994 and it is expected to rise by another 5 percent by 2010 (www.unfpa.org/swp/2001/english/ch02.html). The rise in the consumption of firewood is also likely to contribute to deforestation, desertification and loss of biological diversity because a major portion of the habitats of wildlife and other resources would have been destroyed. This situation about deforestation in Africa is in contrast to what happens in continents such as Europe and North America that have reversed centuries of deforestation and are showing a net increase in woodland areas (www.livescience.com/environment/070313_ap_deforestation_reverse.html).

The political, economic, social, technological and related factors also contribute to environmental degradation in Africa (Goldblatt, 1996: 25). The political and civil conflicts that contribute to the environmental destruction in Africa include the wars in Kenya, Somalia, the Democratic Republic of Congo (DRC) and the Darfur region of

Sudan and neighbouring Chad. It is estimated that the Janjanweed militia in Sudan displaced about 50 000 civilians to Chad (www.irinewes.org/report?ReportID=54299&selectregion=EastAfrica,+WestAfrica). Janjaweed which literally means "armed men on horseback" (www.**tedallas.org**/socialjustice/dollsfordarfur/article.html) are outlawed militias with reported ties to the Sudanese government. They mount attacks on non- Arab/ Muslim ethnic groups that are presumed to be sympathetic to the rebel movement opposing the government of Sudan. The displacement of people by the Janjaweed militia during conflict leads to the exhaustion of resources. The militia use firearms to kill wild animals and they also damage the environment indiscriminately. Secondly, the movement of soldiers on their horses respectively destroys and tramples the vegetation and forests while the emigration of refugees from Sudan to Chad seems to put pressure on the land through increased harvesting of firewood for energy and the construction activities undertaken to create new settlement areas in neighbouring Chad.

The use of energy and the accompanying lack of appropriate technology contribute to the environmental degradation in African countries such as Angola, Cameroon, Gabon and Nigeria. The lack of appropriate technology causes the environmental destruction in the following manner:

> Energy use and natural gas burning contribute to carbon emissions in Nigeria, Angola, Cameroon and Gabon. For example, gas infrastructure in sub Saharan Africa is extremely limited; this associated gas is often burned off or flared than captured for use. Not only does this waste a potentially valuable energy source (the World Bank estimates that every day Africa flares energy equivalent to twelve times the energy that the continent uses) but also releases emissions directly into the atmosphere (www.eia.gov.emeu/cabs/suhafricaenv.html).

As can be seen in the above assertion, Africa's lack of technology contributes to global warming and energy inefficiency. The availability of technology would have ensured the capture and re-use of energy but since this is not the case in Angola, Cameroon, Gabon and Nigeria, toxic gas gets released into the atmosphere.

Another social and economic cause of environmental degradation in the African continent is poverty (UNEP, 2000: 53). Miller (1994:11-12) contends, “Poverty can increase environmental degradation by causing poor people to destroy potentially renewable resources such as soils, forests, and wildlife for short-term survival”. Park (1997:46) states that the poor have no alternative but to overgraze land and grow crops on impoverished land, cut down trees for fuel wood and increase grazing land and farmland.

The discussion above portrays the scenario that the African continent is faced with environmental degradation; however, the steps taken to reverse the negative consequences of this environmental degradation may include the incorporation of Environmental Education (EE). Acar (1993: 26) and Squazzin (1997: 34) view the incorporation of EE in African educational institutions as a long-term solution to preventing environmental degradation. Cornwell (1996: 84-85) and also Ajiboye; Mansaray & Audu (1998: 330) add that one of the methods adopted in Africa to resolve environmental problems was to develop environmental awareness among the population, and to empower and to mobilise communities and school children as agents of change.

Efforts have been made on the African continent to respond to the environmental problems through the incorporation of EE in Africa. UNEP (2000: XXIV) contends that in many Africa nations “environmental awareness and education programmes are expanding almost everywhere, while indigenous knowledge receive greater recognition and is increasingly used. Environmental information systems are, however, still weak”. Environmental degradation in Africa demands attention and calls for an ongoing conscious movement to incorporate EE in school curricula and colleges of education.

1.2.3 Environmental problems in Namibia

Namibia is one of the largest countries in Africa. It is situated in the south western coast of Africa. The country has a population of nearly 2 million inhabitants and occupies a total surface area of approximately 824, 266 km² (Compton’s Encyclopedia, 2000: 9).

Namibia also experiences environmental problems that it inherited at independence on 21 March 1990 (Namibia's Vision 2030, 2004: 31). Some of the environmental problems that Namibia inherited continued to afflict the nation after independence. The environmental problems include land degradation, destruction of woodland areas, desertification, population growth, rural land use conflicts, pollution, urban land use conflicts, water and declining fish resources, survival of wildlife, overstocking, overgrazing and bush encroachment (Moyo, O'Keefe & Sill, 1993: 94-97).

The causes of the above mentioned environmental problems in Namibia are rooted in political, economic, social and technological factors. The political factor that contributes to environmental crisis in Namibia is the lack of measures and political will to combat and satisfy people's needs. The lack of political will and measures to help combat people's needs exacerbates the environmental problems and compels poor people to deplete the resources exposed to them. It has also been noted that 'being deprived of access to water is a silent crisis experienced by the poor and tolerated by those with resources, technology and political power to solve the problems (www.undp.un/-namibia/news-hdr-launch.htm). This asserts that there is still a lack of political will among those who have political power in Namibia to help the poor by providing clean, portable water to them. A situation such as this would eventually force the poor people to put pressure on the scarce water resources, thus causing environmental problems.

A combination of economic, social and technological factors contributes to water pollution, urbanization and desertification in Namibia. This is noted as follows:

> Water is limited, causing a lot of competition for it among humans and animals. Water pollution, therefore is a main concern to the country because the water is already limited. Pollution is a key issue, since Namibia is becoming more and more developed economically and there is more and more waste generated, especially chemical waste. The businesses and the government are still struggling with the problem of disposing all this new waste in a proper manner. Urbanization is another issue, with the population

> increase and is closely linked to desertification. People are letting their cattle overgraze, which leads to desertification (www.darwin.bio.uci.edu/~sustain/90/ namibia.htm).

In the above excerpt, it can be observed that a combination of social, economic and technological factors contribute to the environmental problems in Namibia. First of all, it is shown that Namibia does not have much fresh water; therefore the competition between animals and humans in Namibia is a concern and a problem on its own. Secondly, overstocking of domestic animals on communal land is seen here as a social factor because it is caused by human beings. Overstocking of domestic animals on Namibian land contributes to desertification, overcrowding, habitat destruction and forces other people to move from rural areas to urban areas. Thirdly, the economic factors contribute to pollution because of the substantial waste that is generated by businesses that may be disposed in the environment. The other economic factor is the lack of productive means to dispose pollution produced by businesses in an environmentally acceptable manner.

Population growth is another social factor that could lead to the environmental problems in Namibia. It has been stated that the population growth rate in Namibia is 3.0% (Namibia Vision 2030, 2004: 44). According to the Environment Today (n.d) "The population growth is one of the highest in the world, meaning the population is growing by 60 000 people every year and doubling the present population in 20 years. The population will be doubled but not the resources" (www.namibian.com.na/ Netstories/Environs6-98/enviroday.html). It is shown that the population growth is one of the highest in the world and if it continues to grow on this trajectory, it would obviously outstrip the carrying capacity of the Namibian land. This may further lead to the environmental crises such as land degradation and loss of biological diversity. The effect of population growth on the environmental resources seems to be devastating because 'increasing human population places severe stress on the natural processes that renew some resources' (www.msu.edu/~armst146/population bigideas.html).

In the above discussion, it is shown that Namibia faces environmental problems. Namibia needs to respond to these environmental problems. Firstly, Namibia is a signatory and strong contributor to various international treaties and conventions and continues to keep this commitment at International Level (Ministry of Environment

and Tourism (2007: 8). Some of the conventions to which Namibia is a signatory and strong contributor include the Agenda 21 and Earth Summit; Southern Africa Development Community (SADC) Policy and Strategy for Environment and Sustainable Development: Towards Equity Led Growth and Sustainable Development in Southern Africa; International Convention to Combat Desertification, the Convention on Biological Diversity (CBD); Sub-regional Action Programme to Combat Desertification in Southern Africa (SRAP); the Framework Convention on Climate Change (FCCC); the Convention for International Trade in Endangered Species of Wild Fauna and Flora (CITES); the Convention on Wetlands of International Importance, the International Convention to Combat Desertification, the Convention on Biological Diversity; the Basel Convention on Control of Transboundary Movements of Hazardous Wastes and their Disposal, the Montreal Protocol and the Vienna Convention. "Namibia has acceded to these conventions and have helped to create conditions whereby Namibia is able to deal with sometimes severe constraints that affect proper management of the environment" (MET, 2007: 3).

One of the main methods used to respond to the environmental problems in Namibia is the incorporation of Environmental Education (EE) in the colleges of education. EE is acknowledged as one of the options that can be used to respond to the environmental problems because it empowers *people* to take a leading role in solving the environmental problems and ensure sustainable living (Enviro-teach, 1995:32).

In an effort to raise the profile of EE in Namibia, a number of agencies promoted the incorporation of EE in the formal and non-formal sectors. These agencies include the Namibian Environmental Education Network (NEEN), the Ministry of Environment and Tourism, the Ministry of Education and Culture and the Ministry of Agriculture, Water and Rural Development, Namibian Animal Rehabilitation Research and Education Centre (NARREC), integrated rural development and nature conservation, wildlife society of Namibia and the Rössing Foundation's EE programmes (Mupetami & Le Roux, 1996: 132).

Despite all the efforts to raise the profile of Environmental Education (EE) as a response to social, economic and political causes of the environmental problems in Namibia, the need for empowering communities through education has again been re-emphasised by the Presidential Commission on Education Culture and Training (2001: 24) which suggests that there should be a centralised long-term programme to bring about general understanding of nature. It also suggested that the social factors should be changed empowering people to acquire skills for sustainable living. In this study, it is emphasised that the incorporation of EE as a cross-curricular theme in the Namibian Colleges of Education is one of ways in which social factors can be changed to empower people to acquire the skills for sustainable living.

1.3. STATEMENT OF THE PROBLEM

EE was incorporated in the Namibian Education system after independence (Ministry of Wildlife, Conservation and Tourism, 1992: 100). The Namibian Colleges of Education are some of the educational institutions in which EE was incorporated at independence, although it is not incorporated as a cross-curricular theme. As a result, there are some educators who seem inclined to incorporate EE in the Namibian College of Education while other educators do not appear to incorporate EE in the subjects they teach.

There is a great need to incorporate EE as a cross-curricular theme in the Namibian formal education system (MWCT's Green Plan, 1992: 101; Enviro-teach, 1995: 11-12; Ministry of Basic Education & Culture, 1996: 21 & Squazzin, 1997: 34-35). Because it is not incorporated in the Namibian Colleges of Education as a cross-curricular theme, the teacher trainees, who may complete their pre-service teacher training (PRESET) in the Namibian Colleges of Education may not be in a position to incorporate EE as a cross-curricular theme in the Namibian formal education system because they may not have experienced it themselves as learners. This development contributes to the problem of the study.

The research question that is relevant to this study is: What is the best strategy to incorporate EE as a cross-curricular theme in the Namibian Colleges of Education?

1.4. AIMS AND OBJECTIVES OF THE STUDY

The main aim of the study is to incorporate Environmental Education (EE) for sustainability as a cross-curricular theme in the Namibian Colleges of Education.

The objectives of the study are to:

- Assess the extent to which the EE curriculum goals are incorporated in the Namibian Colleges of Education;
- Analyse the teacher educators' understanding, interpretation and appreciation of the concept cross-curricular as a model for the incorporation of EE in the Namibian Colleges of Education;
- Analyse the constraints that hamper the incorporation of EE as a cross-curricular theme in the Namibian Colleges of Education;
- Assess the conditions that would support the incorporation of EE as a cross-curricular theme in the Namibian Colleges of Education;
- Plan a strategy for the incorporation of EE as cross-curricular theme in the Namibian Colleges of Education.

1.5. HYPOTHESIS

The best strategy for the incorporation of EE in the Namibian Colleges of Education is through the provision of in-service training to the teacher educators explaining how their learning areas could focus on various environmental aspects of education.

1.6. RESEARCH METHODOLOGY

The concept 'research' is defined in different ways. Walsh (2001: 1) supports this assertion as follows: "textbooks usually adopt one of two main approaches to

defining what *research* is". For example, Mertens (1998: 38) maintains that research is a process of *systematic inquiry* that is designed to collect, analyze, interpret, and use *data* to understand, describe, predict or control educational or psychological phenomena or to empower individuals in such contexts'. In this context research is perceived as an organized process of asking questions to collect information that can be used to empower individuals and produce desirable and informed actions. The other way of defining the concept is one that sees research as "a range of practical skills and activities that are used to conduct particular types of investigations" (Walsh, 2001: 1). In this study, research is defined as a systematic process of gathering information, (using widely accepted methods) to produce knowledge and understanding that would empower teacher educators in the incorporation of Environmental Education (EE) in the Namibian Colleges of Education.

There are two basic types of research in education, namely quantitative and qualitative research (Muijs, 2004: 1). According to Walsh (2001: 12) quantitative research always involves measuring in some ways. He further contends that some "researchers set out to collect data that measures 'how many', 'how often', 'what percentage or proportion' or 'to what extent is there connection between X and Y'. When the data has been collected, statistical techniques are used to establish and describe the numerical patterns and relationships that exist in the data". Mertens (2005: 6) also adds that quantitative research "measures variables in a quantifiable manner". In this study, quantitative research is seen as the type of research method that employs numerical values to analyze and interpret data. The questionnaire is a tool that will be used to collect quantitative data in this study.

Qualitative research is different from quantitative research because it does not focus on numerical variables and values. For example, Slife & Williams (1995: 234) defined qualitative research methods as "procedures for investigating human actions that do not involve measurement and quantification, but allow subjects to describe their own behavior and experience". Other authors clarify the concept in terms of what the researchers do. For example, McEwan & McEwan (2003: 79) states that 'qualitative researchers are focused on explaining and interpreting what they observe, hear and read'. In this study, qualitative research is seen as the type of

research method that focuses on description, interpretation and explanation of data. The questionnaire has an open ended section in which the responses will present qualitative opinions and data.

The quantitative and qualitative research methods will be used in this study to:

- Quantify and interpret the extent to which Environmental Education (EE) goals for curriculum development are incorporated in the Namibian Colleges of Education;

- Compare and interpret the meanings that the educators attach to the concept cross-curricular as a model for the incorporation of EE in the Namibian Colleges of Education;

- Quantify, compare and interpret the reasons for not incorporating EE as a cross-curricular theme in the Namibian Colleges of Education;

- Describe the desirable conditions that teacher educators need to incorporate EE as a cross-curricular theme in the Namibian Colleges of Education;

- Quantify and compare the conditions that teacher educators need to incorporate EE as a cross-curricular theme in the Namibian College of Education;

- Review published and unpublished literature that supports the incorporation of EE as a cross-curricular theme in the Namibian Colleges of Education.

The points mentioned above are outcomes that are intended to be generated through the use of quantitative and qualitative research methods. The data and information gathered would be analysed to generate and pave a way for the

production of guidelines about the incorporation of Environmental Education (EE) in the Namibian Colleges of Education.

1.7 LIMITATIONS OF THE STUDY

Most educationally related research has limitations. O'Leary (2005 : 57) and Shimwooshili Shaimemanya (2006 : 24) assert that limitations are conditions that may impact on results of the study. These authors also assert that limititions are conditions that are outside the control of the researcher. The assertion advises any researcher in the field of education to be aware of conditions that may affect his or her study. This awarenes may help him or her to take actions that could prevent them from spiralling out of control. In this study, limitations are conceived as those conditions that are outside the researcher's control and which may impact upon the results of the study if not adequately controlled. In this context, the limitations are noted as follows:

- The first (1st) limitation is about the rate of return of the questionnaire. The rate of return of the questionnaire is heavily depended on the willingness of the respondents to do so. The researcher may only ask but not demand respodents to return the questionnaire.

- The next limitation is about the time of completing the questionnaire. The researcher requires that the respondents complete it within the shortest possible time to avoid withdrawal and occurrence of events that would affect the results of the study. It asserted that the researcher does not have control over this aspect because he may not force respondents to keep to the required time if it does not match with their circumstances and terms of participation.

- The last limitation is the failure by respondents to answer all the questions in the questionnaire. The researcher does not have control over this aspect because he may not force the respondents to answer all the questions.

The actions and efforts that have been made to counteract the limitations include persuading respondents to complete the questionnare honestly. To ask and humbly persuade the respondents to answer all questions, to urge them to stick to the agreed time and to humbly seek support from the authorities in the Namibian Colleges of Education on those limiting factors.

1.8 DELIMITATIONS OF THE STUDY

Most educationally related research has delimitations. According to Punch (2006 : 69) delimitations mean ‘‘defining limits of or drawing the boundaries around a study, and showing clearly what is and is not included’’. This definition expresses that the researcher specifies the focus of study and aspects relevant to the objectives and aims. Shimwooshili Shaimemanya (2006 : 24) argues that delimitations is the ‘‘conditions imposed on the study to make it manageable”. It can be reasoned from the above explanation that deliminations refer to the boundary set by the researcher and the aspects that he/ she imposes on the study in order to facilitate its implementation. The delimitations of this study are noted as follows:

- The focus of this study is the incorporation of Environmental Education (EE) in the Namibian Colleges of Education. The views that will be presented in the empirical part of this thesis are drawn from the teacher educators in the Namibian Colleges of Education;

- Secondly, the study includes aspects that relate directly to the objectives of the study (see section 1.4) ;

- The EE curriculum goals are based on Hungerford & Peyton’s (1994: 113) broad goals for curriculum development. The values of sustainability (Fien, 1993 : 11) are included in the empirical part. These sources were supplemented with the ideas taken from Arms (1994 : 95 - 100); Volk, (1993 : 50-51) and the researcher’s own understanding.

The purpose of including these aspects is to create a conceptual understanding for the depth and scope of EE geared for a sustainable future and to generate empirical data about Environmental Education (EE) practices in the Namibian Colleges of Education.

1.9 PROGRAMME OF THE STUDY

Chapter two (2) will focus on the conceptual understanding of concepts, models and themes for incorporating EE in the Namibian Colleges of Education. The theoretical perspectives that guide the incorporation of EE in Namibia shall be discussed in Chapter three (3). Chapter four (4) will explain the research methodology. Chapter five (5) will present data collected from the respondents of the study. The summary of findings, conclusions and recommendations for incorporating EE as a cross-curricular theme in the Namibian Colleges of Education will be presented in chapter six (6).

THE CONCEPTUAL UNDERSTANDING OF CONCEPTS, THEMES AND MODELS FOR THE INCORPORATION OF ENVIRONMENTAL EDUCATION (EE) FOR SUSTAINABILITY IN THE NAMIBIAN COLLEGES OF EDUCATION

2.1 INTRODUCTION

The focus of this chapter is on the common understanding of concepts, themes and models for the incorporation of EE for sustainability with reference to the Namibian Colleges of Education. The chapter will begin by stating and defining the key concepts that form the basis of this study. These key concepts include *incorporation, environmental education for sustainability* and the *Namibian Colleges of Education.* Following this is an explanation of the factors that justify incorporation of EE in the Namibian Colleges of Education, the clarification of the concept cross-curricular teaching as a model for the incorporation of EE in the Namibian Colleges of Education and the discussion about the incorporation of EE goals in the Namibian Colleges of Education. This information will be obtained from the theoretical views and data of the supporting literature.

2.2. DEFINITION OF KEY CONCEPTS

2.2.1 The concept 'Incorporation'

The review of literature shows a lack of definitions of the concept of incorporation, per se, but the following pronouncements capture the meaning of the concept. Ruskey & Wilke (1994:93) maintain that 'there are three methods that have been most used to incorporate EE into the curricula: Insertion, infusion and integration'. According to these authors 'Insertion' means to place a "special unit of a course as a special unit or into the school curriculum. 'Infusion' is the process in which "EE is built into teaching of just about everything". The authors concluded that the "terms 'infusion' and 'integration' are used interchangeably or to re-enforce one another" (Ruskey & Wilke, 1994:93-94)

The concept ‘incorporation’ is used in this study to capture the notion of infusing or integrating the content of Environmental Education (EE) in the curriculum through the lens and perspectives of different learning areas. The Oxford Advanced Learner’s Dictionary (1995: 603) states that to “incorporate is to include or make something part of the larger whole”. Incorporation in this sense is seen as a process in which the major dimensions of EE are taught through the perspective of natural sciences and social sciences. This approach to teaching ensures that “no subject stands alone in the curriculum” (Muyanda-Mutebi, 2000: 5). The conception that could be drawn from this definition is that teacher educators should teach their subjects in relation to other educators in the educational programme.

In this study, the concept of ‘incorporation’ is defined as a process of teaching or including the concepts, skills, actions, attitudes and values for EE through the perspectives of all learning areas in the Namibian Colleges of Education. Mathematics and Integrated Natural Sciences, Languages and Social Sciences, Pre-vocational Studies and Agriculture, Lower Primary Education and Education Theory and Practice are some of the learning areas that could be used in the teaching of EE in the Namibian Colleges of Education.

2.2.2 The concept ‘EE for sustainability’

In this study, the focus is on ‘EE for sustainability’. The concept shows the inclusion of concepts *environment, education and sustainability*. Although the meaning of these concepts will be defined as a unit at the end of this section, the three concepts are firstly defined separately in order to unfold the contexts from which the main concept of *environmental education for sustainability* is drawn.

2.2.2.1 The concept ‘environment’

Many authors perceive and analyse the concept ‘environment’ from a specific point of view (Lebeloane, 1998: 32). For example, The Encyclopedia of Conservation and Environmentalism (1995: 217) defines the word ‘environment’ as “the area that surrounds or circumscribes human or non-human beings”. This definition describes

environment as the physical place where living and non-living organisms including human beings live. The Oxford Advanced Learners Dictionary (1995: 387) defines the concept 'environment' as the 'natural conditions, such as land, air and water in which people and animals live'. This definition relates the environment to natural resources such as land, air and water. The word 'environment' has been used to refer not only to natural conditions such as land, air and water but also to people (Cock in Cock & Coch, 1991: 2) and the economic impacts on that environment (Pearce in Pearce, 1994: 12). This means that the concept 'environment' has been broadened to include "social, political and biophysical realities" that act on the natural conditions (O'Donoghue, 1995: 16). In this study, the concept environment is used to refer to the total surroundings with the associated social, political economic and bio-physical factors that act upon it.

2.2.2.2 The concept 'education'

The concept education has a variety of definitions. Fraser, Loubser & Van Rooy (1990: 186) defined education as the 'activity engaged in when an adult who has superior knowledge and insight purposefully teaches a child, adolescent or adult in order to become intellectually independant and socially responsible (namely, mature adult)'. According to the Encyclopedia of Educational Development and Planning (1996: 31) 'the word '*E'* means '*out of*' and '*Duco'* means '*I lead*'. "In other words, education is defined as a process of 'leading out the inborn powers and potentialities and enabling the child to become what he/she is capable of becoming".

In this study, the concept education refers not only to leading a child towards maturity but also leading adults towards competitiveness. Education is then defined as a process in which an individual's knowledge, understanding, skills and actions are enhanced to enable the individual to fully utilize such skills to the benefit of themselves and others in the social, economic and ecological surroundings.

2.2.2.3 The concept ‘sustainability’

The concept ‘sustainability’ is subject to a variety of definitions. According to the Dictionary of Natural Resource Management (1996: 308) the term ‘sustainability’ means the “ability of an ecosystem to maintain ecological processes and functions, biological diversity and productivity over time”. This definition is in agreement with, Hardoy; Mitlin & Satterthwaite (1992: 176) who maintain that the term ‘sustainable’ is most widely used in reference to ecological sustainability in terms of the natural resources used either in a specific project or broader programme of human activities. Similarly, O’Riordan (1993: 43) says that the notion of sustainability applies most conveniently to the replenishable use of natural resources.

The term sustainability is used in this study to refer to the use of natural resources while simultaneously conserving ecosystems, life support systems and communities in order that the present and future economy, people and societies benefit fully. In this sense the concept ‘sustainability’ refers to ‘sustainable development’ because the latter includes the “implicit component of sustainability and efficiency” (Metz; Davidson; Swart & Pan, 2001: 19). The World Commission defined sustainable development as ‘the development that meets the needs of a current generation without compromising the ability of future generations to meet their needs” (Global Development Research Center (GDRC) (n.d.) *(http://www.gdrc.org/sustdev/definitions.html)*. The concepts ‘sustainability’ and ‘sustainable development’ are perceived relatedly in the context of this study because the researcher believes that there is no reference to either of these concepts that would not come down to either direct or indirect resource application. Table 1 further explains the notion of ‘sustainability’ and ‘development’ perceived in this study. The table shows what is to be sustained (nature, life support and community) and what is to be developed (people, economy and society).

Table 1: The concept of 'sustainability' and 'development'

WHAT IS TO BE SUSTAINED:	FOR HOW LONG?	WHAT IS TO BE DEVELOPED:
NATURE Earth Biodiversity Ecosystems	25 years "Now and in the future" Forever	**PEOPLE** Child survival Life expectancy Education Equity Equal opportunity
LIFE SUPPORT Ecosystem services Resources Environment	**LINKED BY** Only Mostly But And Or	**ECONOMY** Wealth Productive sectors Consumption
COMMUNITY Cultures Groups Places		**SOCIETY** Institutions Social capital States Regions

SOURCE: U.S. National Research Council, Policy Division, Board on Sustainable Development, Our Common Journey: A Transition Toward Sustainability (Washington, DC: National Academy Press, 1999) (http://www.hks.harvard.edu/sustsci/ists/docs/whatisSD_env_kates_0504.pdf).

2.2.2.4 Environmental Education (EE) for Sustainability: A synthesis

The three concepts discussed in sections 2.2.2.1. - 2.2.2.3 can be synthesized as EE for sustainability. This concept is adopted in this study because EE is the foundation and the 'ultimate goal of sustainable development' (Sauvė 1996:18). The concept EE for sustainability is used in this study to refer to the coordinated activities that started in 1972 when 'Environmental Education' was formally coined by the "United Nations Conference on Human Environment held in Sweden, Stockholm" (Clover, 2000: 213) and the coordinated developments that took place since the World Conservation Strategy established the concept 'sustainability' as a central goal of EE (Loubser & Le Grange, 2005: 115). Since the origin of the concept, there have been numerous definitions that have been proposed (Degenaar, 1988: 45; Wals, Beringer & Stapp, 1989: 13 and Dendinger & Mckeown-Ice, 2000: 38). All the definitions of EE that have been proposed, lead to an aim of 'shifting ecological conscience as a whole, including behaviour and norms belonging to the 'world taken

for granted' (Rovira, 2000:146). The highly quoted definition of Environmental Education (EE) (see the publications of Loubser, (1992: 93); Neal &Palmer, (1994:12); Bornman, (1997: 39) and NEEN, (1999) has been provided by the IUCN (International Union for Conservation of Nature and Natural resources) as follows:

> 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. EE also entails practice in decision making and self-formulation of a code of behaviour about issues concerning environmental quality.

The Namibian Environmental Education Network (NEEN) defined EE as:

> The process of developing environmentally literate citizens who are aware of and concerned about the total environment. They will be 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 and appropriate development of Namibia's resources (NEEN, 1999).

It is important to note that the definitions of EE given above implicitly reflect the three essential dimensions of EE that refer to education as '*about, for, in/through* the environment' *(*Fien, 1993: 5; Neal & Palmer 1994: 29). In this study, it is asserted that the incorporation of EE in varying educational contexts requires the recognition of these elements.

These elements are briefly explained below to show the breadth, depth and scope of EE considered in this study.

First, education *about* the environment refers to the knowledge dimension of EE in which teaching of concepts that generate knowledge and understanding of the environment is maintained. Palmer (1992: 6) states that 'Education *about* the environment: is knowledge and understanding through environmentally related content in other core and foundation subjects'. Additionally, Dempsey, Gresele, Bögeholz*,* Martens, Mayer, Rode, & Rost (1997: 260) maintain that education '*about'* the environment "is concerned with providing cognitive understanding of the issues'. In this study education *about* the environment is recognised as that dimension of Environmental Education (EE) that generates the knowledge and understanding about the environmental problems, issues and crises.

Secondly, education *for* the environment has a tripartite 'conceptualisation' (Willers & van Staden, 1998: 29) that calls for the teaching of the attitudes and values, skills and actions as well as knowledge necessary for the maintenance and protection of the environment. Palmer (1992: 6) says that education *for* the environment is based on values, attitudes and positive action. Education *for* the environment is concerned with finding ways of ensuring sustainable use of the environment now and in the future; finding solutions to environmental problems, taking into account the fact that there are conflicting interests and different cultural perspectives; and informing the choices which have to be made". Palmer (1998:144) maintains "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 and caring use of the planet and its resources". In this study, education *for* the environment is recognised as the dimensions of EE that inculcate the values, attitudes, knowledge and skills for resolving the environmental, problems, issues and crises.

The third dimension is education *in/through* the environment. This dimension focuses on the development of environmentally related actions and skills and uses the environment itself as a tool for learning about the environment. Palmer (1992: 6) states that education *in/through* the environment: uses the environment as a resource for the development of skills; for direct experience, enquiry and investigation". Neal and Palmer (1994: 29) also add that "education *in/through* the environment uses the environment as a resource for learning. It is a resource which

enables the development of a great deal of knowledge and understanding as well as skills in investigation and communication". This study recognises education *in/through* environment as the mode of EE that does not only generate the skills and actions but also knowledge, understanding and values for resolving the environmental problems, issues and crises.

In this study, Environmental Education (EE) for sustainability is defined as a process of teaching and learning in which environmental concepts are explained and the environmental values and attitudes are explored through direct interaction with the environment to create the behaviour that empowers individuals and groups to lead an improved quality of life and ensure the sustainability of systems in the social, natural and economic environments.

2.2.3 The concept 'Namibian Colleges of Education'

The concept above shows the inclusion of three concepts. These concepts are 'Namibian', 'Colleges' and 'Education'. The 'concept' education has been already discussed in section 2.2.2.2. The concept 'Namibian' stems from the word 'Namibia', which is a name of a country situated on the west coast of Southern Africa. The word 'Namibian' is used in reference to the colleges of education that are located in Namibia. According to the Britannica Concise Encyclopedia (http://www.answers.com/topic/college) the concept 'college' is a term most often used today to "denote an educational institution". In line with the above definition, the Oxford Advanced Learner's Dictionary (1995: 2002) maintains that a College is an institution for higher education or professional training". Although the definitions above portray the concept college as an institution that offers general education or professional training, the concept is used here to refer to those educational institutions that only offer education and training for teachers in Namibia. In this study, the concept of Namibian Colleges of Education is defined as the educational institutions in Namibia that provide tertiary training and education for primary and secondary school teachers.

2.3 FACTORS THAT JUSTIFY THE INCORPORATION OF ENVIRONMENTAL EDUCATION (EE) FOR SUSTAINABILITY AS A CROSS-CURRICULAR THEME IN THE NAMIBIAN COLLEGES OF EDUCATION

One of the major reasons that justify the incorporation of EE in the Namibian Colleges of Education is to empower the colleges so that they are able to train teachers well suited to the task of incorporating EE in a holistic and integrated manner in the Namibian formal education system. The Namibian Colleges of Education are viewed in this thesis as educational institutions in Namibia that provide professional training and education for primary and secondary school teachers. In this regard the rationale for incorporating EE in the Namibian Colleges of Education could be seen in the context of the following assertion:

> Administrators and faculties of teacher education have potential to bring about tremendous change, because they create the teacher education classroom, train new teachers, provide professional development for practicing teachers, consult with local schools, and often provided expert opinion to regional and national ministry of education (UNESCO, 2002: 41).

From the above assertion, it can be reasoned that the incorporation of EE in Namibian Colleges of Education is not an end in itself but a means to an end. The ultimate end is to have EE fully and effectively incorporated in the Namibian education system as a whole. For example, Squazin, (1997: 35) states that one of the firmest suggestions arising from the evaluation of the enviro-teach programme was that the incorporation of EE in the Namibian Colleges of Education "enables BETD students to carry these ideas and methods with them to their schools on completion of the course".

The following factors further explain the rationale for the incorporation of EE in the Namibian Colleges of Education using a cross-curricular model.

2.3.1 Historical factors

Historical factors include the colonial legacy and practices that shaped the incorporation of Environmental Education (EE) in Namibia before independence. It has emerged from literature sources that the historical legacy and colonial practices in Namibia led to the "perception of environmentalism as alienating and exclusive" (Squazin, 1997: 32) because it did not permeate the entire aspects of education. Brown (1996: 16) noted that' there was a lack of information, awareness, education, popular participation and training for decision-making in environmental management'. This lack of information, awareness and popular participation meant that EE as a cross-curricular theme became a reality when it was introduced as a subject at independence. Additionally, documents such as the Green Plan (1992) and the National Assessment Report for the World Summit of Sustainable Development (2002) acknowledge the potential of EE as a cross-curricular theme.

The Historical factors explain that EE is a new approach to all education which was introduced in Namibian education at independence, about 19 years ago. The fact that EE was introduced in Namibia recently means that those educators who completed their training before independence are not familiar with the content, methods, assessment and instructional approaches that are acceptable in this area of learning. These educators may not be in a position to teach and incorporate it accordingly. It also means that a lot still needs to be done to familiarise the educators with the contents, strategies and assessment for its incorporation in both the primary schools, secondary schools and the Namibian Colleges of Education. These are some of the historical reasons that justify the incorporation of EE using a cross-curricular model in the Namibian Colleges of Education.

2.3.2. The nature of EE

The incorporation of EE in the educational programmes is fraught with confusion among the educators. Gayford (1998: 102) maintains that "environmental educators have always been struggling with questions about the nature, purpose and scope of the field since the early days when this area of the school curriculum was first

specifically identified". Other authors maintain that the nature of Environmental Education (EE) causes confusion among educators in terms of 'its place in the school curriculum and implementation strategies' (Walter, 1997: 254). For example, EE is considered as a single subject but the place of EE is in all learning areas and subjects at all school levels (Neal & Palmer, 1994: 9; Ruskey & Wilke, 1994:94; Schulze, 1996: 110 & Bornman, 1997: 25).

It is also noted that EE is multidimensional in nature. Gayford (1998; 103) maintains that one of the "fundamental qualities of environmental education that has emerged is that issues that related to the environment have economic, cultural, aesthetic, political and spiritual dimensions". This multidimensional nature is of a particular challenge to any educator or those who plan the curriculum (Smyth cited in Gayford (1998: 103).

This fundamental quality and nature of EE has created barriers that prevented this approach to all education from being fully incorporated in the educational programmes because educators may lack knowledge and not feel confident to incorporate EE in this manner. This notion is supported by authors such as Knamiller (1987: 57) and May (2000: 5). In these sources it is asserted that the multidimensional nature of EE makes identifying its content and elements vital to its success very challenging.

The discussion above reflects that EE is dualistic because it could be incorporated as a single subject and as an infused subject. It is also shown that EE is multidimensional because it relates to political, economic, aesthetic and spiritual dimensions. Because these two natures of EE create barriers and challenges that inhibit incorporation in the formal education curriculum, this study holds the following views:

- The incorporation of EE in Namibian Colleges of Education may ensure the full understanding of the nature, purpose and scope of EE among teacher trainees;

- Teachers would eventually feel confident in dealing with the programme for the incorporation of Environmental Education (EE).

2.3.3 Lack of qualified and skilled teachers in EE

One of the fundamental problems that face EE is the lack of qualified teachers who could be in a position to effectively incorporate it in the curriculum of formal education. This assertion is supported by a range of publications in Namibia and elsewhere in the world. Gebreab & Bak (2000: 10) maintain that 'there seems to be a severe shortage of skilled teachers able to integrate EE effectively into the educational programme'. Recently, the Namib Desert Environmental Education Trust (NaDEET) (2006: 2) also made a similar assertion in the context of Namibia by emphasising that "Environmental Education (EE) remains a small, understaffed field in Namibia where adult education and training is crucial to overcoming this gap" (http://www.nadeet.org/pics/newsletter/NaDEET's%20Annual%20Report%2005-06.pdf).

This study is of the view that one of the ways in which the lack of qualified and skilled teachers may be addressed in Namibia is through the provision and the incorporation of EE in the Namibian Colleges of Education because these institutions train teachers. In view of the above assertions in Namibia and elsewhere in the world, this study asserts the following views:

- EE must be incorporated in the Namibian Colleges of Education in the same way as it would be incorporated in the primary school and secondary schools;

- The incorporation of EE would ensure that teacher trainees who graduate from the colleges of education be in a position to carry these values to the classroom and be able to effectively teach the EE content to the school learners.

2.4 CLARIFICATION OF THE CONCEPT 'CROSS-CURRICULAR TEACHING' AS A MODEL FOR THE INCORPORATION OF EE FOR SUSTAINABILITY IN THE NAMIBIAN COLLEGES OF EDUCATION

The aim of this section is to explain the concept 'cross-curricular teaching' as an approach used to incorporate Environmental Education (EE) in Namibian Colleges of Education. In doing so, the following aspects will be looked at:

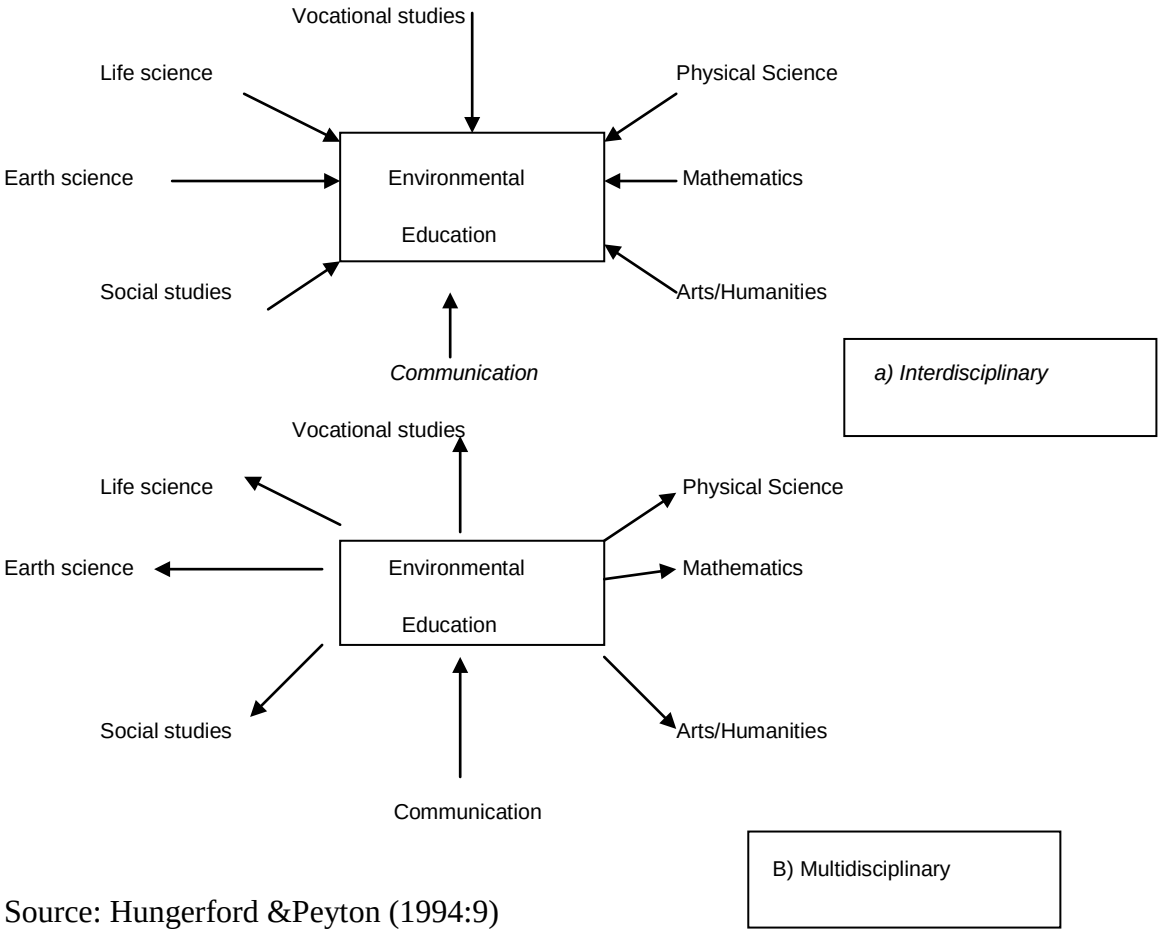
- The definition of the concept of 'cross-curricular teaching model' in the context of this study
- Approaches for incorporating the 'cross-curricular teaching model' in the 'Namibian Colleges of Education'
- The position of this thesis in respect to the approaches of the cross-curricular model
- Advantages and disadvantages of following the interdisciplinary approach and the multidisciplinary approach

'Cross-curricular teaching' is a widely accepted model of introducing EE in the curriculum. Neal & Palmer (1994: 23) indicate that EE is an officially recognized and documented 'cross- curricular theme' of the National Curriculum for schools. Additionally, Loubser (1997: 26) says that EE may be a good example how a 'cross-curricular approach' to teaching may be implemented. In Namibia, the concept cross-curricular has also been adopted in reference to EE. The Ministry of Basic Education and Culture (1996: 27) asserts that the main cross-curricular themes which are integrated throughout the curriculum in all phases are population education, health education and environmental awareness. For the purpose of this study EE is also seen as a subject of an educational curriculum that should be incorporated using a 'cross-curricular model' in the Namibian Colleges of Education.

There are different ways of defining and explaining the concept ‘cross- curricular’ teaching model in EE. For example, Hale & Hardie (1993: 15) maintains that cross-curricular elements transcend the core and foundation subjects and serve to unify the whole curriculum. Other definitions of the cross-curricular teaching model of Environmental Education (EE) refer to it as the application of knowledge in the field of study. Harkins (n.d.) also defines the concept cross-curricular teaching as a model of teaching that “involves a conscious effort to apply knowledge, principles, and/or values to more than one academic discipline simultaneously’’ (http://teach.valdosta.edu/are/vol5no1/Thesis%20PDF/ HarkinsA_ARE_Article.pdf**).** These two definitions indicate that the cross-curricular teaching model recognizes the use of all learning areas to teach an environmental education topic. In this study cross-curricular teaching model is defined as a teaching model that enables the teacher educators to cooperate in the selection, teaching and assessment of an environmental education topic using the lens and the perspectives of their learning areas.

There are two approaches of introducing the cross-curricular teaching model of teaching. These are the so called ‘single subject approach’ and ‘infusion approach’ shown in figure 1. The ‘single subject approach’ means incorporating EE as an ‘interdisciplinary subject’ while the ‘infusion approach’ means incorporating EE as a ‘multidisciplinary subject’. In this study incorporating EE as an ‘interdisciplinary subject’ describes an approach that incorporates elements of core subjects of the educational curriculum into the dimensions or subject matter of EE. This approach draws content from mathematics, natural sciences, languages and vocational subjects and channelizes it into one subject called EE that will be taught by one educator. On the one hand incorporating EE as a multidisciplinary subject describes an approach that takes the subject matter of EE to ‘many’ different subjects of the educational curriculum. In this case, this approach draws content from EE and channelizes it into many different subjects taught by different educators. This explanation is captured by UNESCO-UNEP (1988: 49) as follows: “Interdisciplinary has separate course content for achieving EE goals and objectives. The ‘infusion model’ follows the Multidisciplinary model”. The differences between these two approaches for the incorporation of EE are further illustrated in figure 1.

Figure 1: Interdisciplinary versus multidisciplinary approaches for Environmental Education (EE)



Source: Hungerford &Peyton (1994:9)

The point of view held here is that in incorporating EE in the Namibian Colleges of Education both of these approaches may be used. A 'separate 'or 'interdisciplinary approach' incorporates EE content only in traditional environmental subjects such as biology, social studies and integrated natural studies. An 'infusion' or 'multidisciplinary' approach is inclusive because it supports the teaching of EE using traditional environmental education subjects alluded to above as well as subjects such as mathematics, languages and vocational subjects. This may be done at a time during the educational calendar when educators decide to come together to identify an EE theme, teach it and assess it through the lens of their subjects. The advantages and disadvantages of following either approach are discussed in table 2.

Table 2: Advantages and disadvantages of interdisciplinary (single subject) and multidisciplinary (infusion) characteristics for Environmental Education (EE)

Considerations	Interdisciplinary (single subject) characteristics	Multidisciplinary (infusion) characteristics
1. Ease of Implementation	Easier to implement as a single subject if time permits in the curriculum; teacher training is less of a problem	Requires that more teachers be trained; greater coordination of the curriculum necessary; requires less time/ content in the existing curriculum
2.Teacher competencies	May require fewer teachers but with more in-depth training in EE; thus teacher training is less demanding in terms of teacher numbers but more demanding in terms of level of competencies required	Requires teachers of all disciplines to be competent to adapt and/ or use EE material, although perhaps not to the same depth as in single subject approaches
3. Demand on curriculum load	Requires addition of this discipline to an already overcrowded curriculum	May be effectively implemented with minimal demands on existing curricular load
4. Ease of curriculum development	Components easier to identify and sequence	May be effectively identified, sequenced, and accommodated by the existing curriculum
5. Evaluation	A comprehensive evaluation is much easier to accomplish in a single subject curriculum	Comprehensive evaluation difficult due to the number of variables involved
6. Age level appropriateness	May be more appropriate at secondary than elementary level. Some types of EE goals, may be more appropriate at secondary and tertiary levels	Appropriate at all age levels with some exceptions at secondary and tertiary level
7.Effectiveness on teaching for transfer	More difficult to use in effectively teaching for transfer, requires special efforts to do so	Teaching for transfer is inherent in approach when properly used. Infusion permits decision-making to take place in other disciplines in an environmental context
8.Ability to provide in-depth coverage of environmental issues	Budgetary consideration entirely dependent on the nature of the course being developed. A highly sophisticated course demanding many fields excursions or laboratory equipment could prove costly	Monetary consideration very dependent on the nature of the curriculum being developed. Monies required could be greater than in single subject curriculum due to the numbers of learners involved across numerous(age) levels

Source: Hungerford & Peyton (1994:10)

Additional to the advantages above, the ‘cross-curricular’ approach to teaching offers a variety of advantages for teaching and learning. The cross-curricular teaching model enables learners to:

- Integrate and enrich the learning process;
- Acquire, communicate, and investigate worthwhile knowledge in depth;
- Acquire knowledge through other disciplines;

- Create relationships among various sources of knowledge;
- Make choices, interact, collaborate and cooperate;
- Apply what they learn in a meaningful and real world context;
- Participate and learn together;
- Formally and informally assess understanding and application;
- Encourage learners to examine and interpret the environment from a variety of perspectives: physical, geographical, biological, sociological, economic, political, technological, historical, aesthetic, ethical and spiritual (Neal & Palmer, 1994: 29; Schulze, 1996: 111 and Khosa, 2002: 22).

From the above it can be reasoned that the cross- curricular teaching model creates an environment in which the learners learn together through the interaction and application of the knowledge they gained as a group in order to solve environmental problems, issues and crises that they may have identified. These ideas correlate with the generation of knowledge, values, actions and attitudes about the environment through the use of the environment itself as a resource for learning.

2.5 THE INCORPORATION OF ENVIRONMENTAL EDUCATION (EE) GOALS FOR CURRICULUM DEVELOPMENT IN THE NAMIBIAN COLLLEGES OF EDUCATION

The content of this section is structured around two key concepts. These concepts include '*Goal'* and *'Curriculum developme*nt'. The definitions of these concepts will be explained below in order to show the meaning that fits with the purpose of this study and content of this section.

The concept 'goal' has several meanings that can be applied in different contexts. The Oxford English Reference Dictionary (1995: 597) defines a 'goal' as "the object of a person's ambitions or effort", an aim, a destination". Wiles & Bondi (1993: 84)

maintain, “Educational goals are statements of the intended outcomes of education”. The intended outcomes of education alluded to above “describe large blocks of subject matter found in a unit or course of study” (Melograno, 1996: 64). In this study the concept ‘goal’ is used to describe broad statements of intended outcomes of Environmental Education (EE).

The concept or term ‘curriculum development’ lends itself to different interpretations (Carl, 1995: 47). According to Fraser, Loubser & Van Rooy (1993: 210) ‘Curriculum development’ is defined as “all processes necessary to plan, design, implement and evaluate a functional curriculum”. Wiles & Bondi (1993: 81) says that curriculum development involves “deducing appropriate goals and objectives”. For the purpose of this study, ‘curriculum development’ refers to process of establishing goals that set the direction of a course or a programme for EE.

The first stage in establishing the direction of a programme is to set the goals (Volk 1993: 52). In that regard, ‘goals for curriculum development’ in EE were established, set and developed. These goals are categorised into the following broad areas: ecological foundation; conceptual awareness: issues and values; investigation and evaluation and environmental action, training and application (Hungerford & Peyton, 1994: 113).

The section below explains the ‘goals for curriculum development’ in EE that may guide the direction for the incorporation of EE in the Namibian Colleges of Education. The discussion will address the following aspects:

- The relationship between these ‘goals’ and the dimensions of ‘EE: education *about* the environment, education *for* the environment and *in/through* the environment;

- The subgoals that may be incorporated in the Namibian Colleges of Education under each goal;

- The significance of each goal to the realisation of the main aims of EE.

2.5.1 Goal 1: Ecological Foundation

In this study, goal1: Ecological foundation means education *about* the environment. The subgoals in this category guide educators to incorporate knowledge that enables learners to apply ecological theories and examine knowledge systems that cause environmental problems, issues and crises. This knowledge enables learners to examine solutions and make "sound decisions with respect to environmental issues" (Volk, 1993: 52).

Volk (1993: 50-51) and Gardella cited in Volk (1993: 70-72) also listed several ecological foundation subgoals that may be incorporated in the Namibian Colleges of Education. The subgoals that are listed in this category include the following:

- Individuals and population: This subgoal inculcates nature and behaviour of population such as birth, growth, change and its effects, death and extinctions;

- Interactions and Interdependence: This subgoal explores natural communities in terms of their structure, behaviour and interaction of individuals and nature in places like forests, deserts, seas, ponds as well as examining food chains and food webs as well as predation;

- Energy and Chemical cycles: This sub goal examines how energy passes through primary consumers, secondary consumers and decomposers and how chemical cycles such as water cycle, oxygen cycle, nitrogen cycle, phosphorus cycle and sulphur go through natural systems;

- Succession: This subgoal explores how primary succession and secondary succession takes place. Primary succession is defined as process that takes place when the weathering of rocks leads to soil formation and introduction of pioneer plant and animal species. Secondary succession is defined as all process that takes place when an abandoned area of land is returned to an original climax community through the

growth of successional plants and re-emergence of organisms in an area that was disturbed by human activities;

- Homeostasis is the state of balance or equilibrium in a natural environment. This subgoal explores how human activities affect this balance in the natural environment. In this study, the concept of homeostasis is used to refer to the equilibrium or disequilibrium that may be created in the following spheres of the global environment. Firstly is the geosphere in which disequilibrium may be created through soil erosion, salinization, and irrigation, destruction of soil, nuclear waste and use of pesticides. Secondly, the hydrosphere which often results in the depletion of underground water, contamination of water, toxic oil spills and ocean pollution. Thirdly, the atmosphere which can be affected by smog pollution, air pollution, ozone depletion and noise pollution. Next is the biosphere that may be affected through the loss of living creatures, extinction, and loss of natural ecosystems. Last is noosphere that may result in the degradation, pollution, depletion and destruction of the physical and biological foundation of human life (Hoff & McNutt, 1994: 2-3);

- Ecosystem: In this subgoal, the structure, interaction and effects between living and non-living organisms such as interdependence and components of the ecosystem such as mineral nutrients, water, oxygen, habitats, the biotic factors and abiotic factors is explored. The sub goal also explores the niche which is defined here as the functional role of the organisms in the community as determined by its needs and its interrelationships with other components of the environment" (Kemp, 1998: 260). It also explores the various ways in which organisms deal with change in the environment. Firstly, is through conforming. This occurs in organisms that do not control their internal conditions but change as their external environment changes. The organisms that adopt this strategy are reptiles. The second strategy is regulating which happens when organisms that do not control their internal conditions maintain optimum range in spite of external conditions. Human's beings maintain constant body temperature by wearing clothes

or conditioning the environment to suit them. Next strategy is to be dormant. This is a state of reduced activity during the time when environmental conditions are not suitable, like too cold or too dry and when food is not enough. The last strategy is migrating which occurs when organisms move to a more favourable habitat when conditions become unbearable (http://milanareaschools.org/~wbenya/Biology/notes/ecology%20intro.pdf);

- Man as a component of the natural systems: This sub goal explores the effects of human behaviours such as technology use. The sub goal also explores people's attitudes and values on natural resources (Volk, 1993 : 50-51 and Gardella cited in Volk, 1993 :71-72)

The essence of the subgoals in this category is to create awareness that leads to an understanding of the principles and functioning of the environment and ecosystems, causes and effects of its degradation. This enables learners to understand an acceptable balance that is required with the so called human intervention. This goes without saying that "change must occur in such a way as to not completely upset equilibrium" (Hoff, 1995: 19).

2.5.2 Goal 2: Conceptual Awareness, Issues and Values

In this study, goal 2: Conceptual Awareness, Issues and Values means education *about* the environment. The sub goals at this level guide educators to incorporate understanding that enables learners to apply conceptual awareness and skills about how individual's collective actions and group actions may influence the relationship between quality of life and quality of the environment. The Oxford Advanced Learner's Dictionary (1995: 237) defines the word 'conceptual' as an adjective that is "based on concepts". The researcher can deduce that this level of subgoals enables learners to collect and analyse information and use this understanding to describe how human values cause environment problems and crises.

Volk (1993: 50-51) and Gardella cited in Volk (1993: 70-72) listed some conceptual awareness: issues and values subgoals that may be incorporated in the Namibian Colleges of Education. The researcher recognises that the subgoals in this category

should explore sustainable development (see section 2.2.2.3) because it is a concept that was formed by human beings to address environmental issues in the context of social and economic conditions. The subgoals that are listed in this category include the following:

- How human cultural values influence the environment: This subgoal explores the definition of sustainable development as well as the cultural interactions such as politics, religion and society that take place between individual and environment. These could interfere with the goals of sustainable development such as poverty eradication, environmental sustainability and the core values of sustainability such as "basic human needs, human rights, participation, intergenerational equity, interdependence, biodiversity, living lightly on earth and interspecies equity" (Fien, 1993:11);

- Identification of difference between an environmental problem, an environmental issue and an environmental crisis. The differences are understood in this study as follows: Barbier (1991: 76) defines an environmental problem as a "degradation of natural capital". In this study an environmental problem means an undesirable state that causes destruction to the environment i.e. pollution, global warming and deforestation. Secondly, an environmental issue is a "topic of concern to society because of actual or potential human impact on environment and/or the impact of natural environment on society" (The Encyclopaedic Dictionary of Environmental Change, 2001: 198). In this study, an environmental issue means different ways, thoughts and ideas of people and their solutions to the environmental problems. An environmental issue consists of four parts: *objective*, which sets out the expected environmental results and guides the formulation of strategies to achieve the objective. The *design requirement* describes the minimum requirements that must be addressed by planners. P*erformance requirements* define what must be done to achieve the desired outcome. P*erformance measurements* set out ways of measuring the performance requirements to determine whether the desired outcome is being achieved

(http://www.environment.nsw.gov.au/waste/envguidlns/composting glossary.htm).Thirdly, the Encyclopaedic Dictionary of Environmental Change (2001: 195) maintains that environmental crisis is a "severe decline in biological productivity and associated soil degradation resulting from extensive and persistent adverse human impacts on ecosystems and landscapes". In this study, environmental crisis refer to an environmental problem that is out of control such that it poses dangers and difficulties to the sustainability of resources;

- How cultural activities such as politics, religion, and society affect the environment: In this study, politics refers to decisions made by politicians, religion explores how people's beliefs affect the environment while society describes the effect of poverty and the drive for resources on the environment;

- How the individual and people in groups affect the environment: This subgoal enables learners to explore the effects of the *individual actions and group behaviour* on the environment;

- Identification of attitudes and values toward an issue or the environment;

- Communicate that there may be one way to solve an environmental problem or crisis. There are three (3) problem solving approaches that may be adopted when incorporating this subgoal in the curriculum. The first approach is analytic problem solving. This approach involves a situation in which there is only one choice or alternative. The learners then explore the pros and cons of that choice or alternative and then implement the alternative if it is deemed appropriate. The second one is judgmental problem solving in which learners choose between two or more choices. The last approach is decision-making and problem solving which is described in this context as a process in which learners adopt a decision-making process and then develop alternatives. Learners finally choose between those alternatives (http://www.depts.ttu.edu/hs/rhim5200/htm_files/0022.htm);

- Communicate that the difficulty in solving the environmental problems is also caused by different attitudes and values that people involved in them have (Volk, 1993: 50-51 and Gardella cited in Volk, 1993:71-72).

The essence of the subgoals in this category is to generate an understanding of man's creative inventions, interpretation of the natural world as well as generating investigation skills about how human cultural activities influences the environment. The effective incorporation of key goals may also generate information and understanding about how human beings could strike a balance between cultural activities and environmental protection.

2.5.3 Goal 3: Investigation and Evaluation

In this study, goal 3: Investigation and Evaluation is consistent with education *for* environment. The subgoals in this category guide educators to incorporate knowledge that enables learners to apply problem solving skills in order to examine beliefs, values, ethics and attitudes that cause a variety of environmental problems, issues and crises as well as their related solutions (Spork, 1992: 147; Neal & Palmer, 1994:29).

Volk (1993: 50-51) and Gardella cited in Volk (1993: 70-72) listed several investigation and evaluation subgoals that may be incorporated in the Namibian Colleges of Education. The subgoals that are listed in this category include the following:

- Problem solving skills to identify specific environmental problems and issues. The objective of this subgoal is to inculcate the following skills: recognizing environmental problems, defining environmental problems, listening with comprehension, collecting information, organizing information, analyzing information, generating alternative solutions and developing a plan of action (http://naaee.org/npeee/learnerguidelines/Stapp-iiA.html). The goal also empowers learners to examine constraints that people face when resolving those environmental problems and issues;

- Identification of the actors and stakeholders involved in an environmental issue: This subgoal enables learners to identify the stakeholders and actors in terms of their status, interest and the contribution to environmental problem solving;

- Identification of beliefs and values that explain people's positions on an environmental problem and issue. The main values may be drawn from deep ecology, ecocentrism, technocentrism, holistic management and sustainable development;

- Examination of a variety of issues and the solutions: The subgoal enables environmental educators to focus on different environmental issues such as clean water, protecting forests, preserving wildlife and keeping air clean with all different types of solutions that are needed to solve those issues. The solutions to be adopted by learners may include lobbying, grass-roots organizing, and land management. This diversity provides an avenue for students to take action on an issue or problem and identify the issues or problems they are most passionate about;

- Examine the ecological costs and benefits of designated solutions to environmental problems, issues and crises: In this study, the ecological costs indicate loss of environmental resources that may be incurred as a result of destructive action on the environment. The ecological benefits refer to how organisms and the natural environment benefits from positive action on environmental problems. The inclusion of this subgoal in the educational programme enables learners to calculate the costs and benefits of solutions to environmental problems;

- Identification of the human costs and benefits of designated environmental problems and issues (Volk, 1993: 50-51 and Gardella cited in Volk, 1993:71-72).

The essence of the subgoals in this category is to generate the practical skills, problem solving skills and knowledge of a variety of environmental problems, issues and crises that take place in the geosphere, hydrosphere, atmosphere, biosphere and noosphere and to enable learners generate passion to solve and act on the environmental problems and issues. These sub goals combine all dimensions of Environmental Education (EE) because it enables learners to have the knowledge of the environment as well as the passion and desire to decide on EE informed action. Action on environmental problems, issues and crises could also be taken.

2.5.4 Goal 4: Environmental Action Skills, Training and Application

In this study, goal 4: Environmental Action Skills, Training and Application means education *in/through* the environment. The subgoals in this category offer the development of a great deal of knowledge and understanding as well as citizen skills and actions of investigation and communication (Neal & Palmer, 1994:29). Those skills and actions are needed to solve environmental problems, issues and crises.

Volk (1993: 50-51) and Gardella cited in Volk (1993: 70-72) listed several environmental action skills, training and application subgoals that may be incorporated in the Namibian Colleges of Education.The subgoals that are listed in this category include the following:

- Communicating the need for responsible citizen action to resolve environmental issues. Responsible citizen action includes participation, community problem solving, eco-management and education;

- Communicating levels of environmental action: First is the *individual* level, which refers to a single human being acting to change the effect of environmental damage. The second one is the *group* level which is a collection of people that share a common interest on an environmental action and the last is *organization* level which is a legally constituted body formed by individuals with the purpose of meeting pre-determined standards;

- Identify environmental action categories: The first action category is *eco-management* which is a physical action taken to help improve the status of an issue, for example, picking up litter, building with wood, dux boxes, planting sea oats on dunes. The second action category is *persuasion* which is the act of trying to convince a person or persons that a certain action is incorrect. The third action category is *consumer action* which is the act of buying or not buying a product or service. This action category relies on economic power of individuals to support or not support an idea. Next is *political action*. This is an action that brings pressure on political and governmental agencies and their representatives to persuade them to a certain action. Actions in this regard include lobbying, campaigning for a political candidate who supports an environmental cause and letter writing to elected officials about environmental matters. The last action category is *legal action* which is an action that uses the legal system to bring about a certain solution to an issue. This action category uses court orders, law suits and injunctions to enforce compliance to environmental management (Volk, 1993: 50-51);

- Examination of case studies that allow learners to apply the knowledge of environmental action and to choose responsible environmental action. Learners are exposed to *persuasion*, *consumer action*, *political action* and *legal action* as described above. The learners should be able to choose the right action that fits the context;

- Identification of human and ecological costs and benefits of an identified environmental action. In this study human benefits indicate the social and economic benefits that human beings derive from an environmental action. Human costs are described as the costs incurred as a result of taking an environmental action in monetary terms. Ecological benefits describe how the biological diversity benefits from an environmental action. Ecological costs explain damage that may be incurred or inflicted on the environment as a result of the proposed environmental action;

- Individuals or a group of learners take action on an environmental problem that they have identified. This is a process in which an individual, a group or an organization takes environmental action categories alluded to above. In order to take these action catagories learners should acquire writing skills, research skills, public speaking skills, teaching skills, outdoor skills, environmental education skills such as the knowledge of biology and ecology as well as fund raising skills and skills in managing people (http://naaee.org/npeee/materials_guidelines/chap3.pdf). (Volk, 1993 : 50-51 and Gardella cited in Volk, 1993 :71-72)

The essence of the subgoals in this category is to incorporate environmental action categories and skills necessary to solve environmental problems and ensure sustainable living. These subgoals enable learners to gain knowledge for the identification of environmental problems, decide on an appropriate action and then apply that action in real life situation.

2.6 SUMMARY

In this chapter, an attempt was made to define some common concepts that form the basis of this study. The rationale for the incorporation of Environmental Education (EE) was also discussed in relation to the status, purpose and function of the colleges of education in the Namibian Formal Education System.

The concept of cross-curricular teaching as a model for the incorporation of EE in Namibian Colleges of Education was also clarified.

The curriculum goals of EE were also clarified. These goals must be incorporated in the Namibian Colleges of Education through the use of the cross-curricular model of teaching.

The next chapter will discuss the theoretical perspectives for the incorporation of EE in the Namibian Colleges of Education.

THEORECTICAL PERSPECTIVES FOR THE INCORPORATION OF ENVIRONMENTAL EDUCATION (EE) FOR SUSTAINABILITY IN THE NAMIBIAN COLLEGES OF EDUCATION

3.1 INTRODUCTION

This chapter reviews the theoretical perspectives that form the foundation for the incorporation of EE in Namibia and the Namibian Colleges of Education. The theoretical perspectives that are reviewed include: The historical perspective of EE. The historical perspective traces the origin of concepts 'Environmental Education' and 'sustainability. These are some of the most important concepts that form the basis of the discussion in this study. Following that is the discussion on the perspectives on theories of modern environmentalism. The 'history' and 'theories' presented here demonstrate the wider context of EE that guides the incorporation of EE in the Namibian local educational context. The other perspective that is presented in this chapter is the policy perspective. This perspective shall demonstrate the normative and descriptive dimensions of policies that have been developed in Namibia in order to guide the incorporation of EE.

3.2 THE ROOTS OF EE: AN OVERVIEW

The understanding and origin of EE has its roots in the 19th century (Irwin & Lotz-Sisitka, 2005: 38). This understanding and origin came as a result of the industrial revolution that had caused an unprecedented alienation of man from nature. Irwin & Lotz-Sistka, (2005: 38) also listed several critics who contributed to the current understanding of EE. The list includes a poet by the name of William Wordsworth (1770-1850). The work of the poet favoured informal natural education over an artificial form of schooling. David Kropoktin (1842- 1921) and Henry David Thoreau (1712- 1778) were philosophers. Their philosophies emphasised that natural conditions are becoming unfavourable to species. These conditions should be reversed in order to create an environment conducive for natural organisms to

survive. Frederich Le Play (1817-1862) and Friedrich Engels 1820-1895) were pioneer sociologists. They maintained that the manipulation of sociological environments could achieve beneficial results for the natural environment. Charles Darwin (1806-1882) was a biologist who founded the theory of evolution. The theory of evolution is underpinned by the notion of natural selection. Natural selection is based on the idea that living organisms compete for limited resources in order to survive. The struggle for survival among individual species leads to the extinction of some weaker species and domination of the stronger ones (Compton's encyclopedia, 2000: 38; Irwin & Lotz-Sistka, 2005: 38; the Theory of Evolution (n.d.) http://www.conservapedia.com/ Evolution and Lewin, 2007: 39-64).

The writings of the critics enumerated above showed the burning need to preserve nature in the face of dwindling natural resources and unfavourable environmental conditions.

3.3. PERSPECTIVES ON HISTORICAL LANDMARKS FOR THE INCORPORATION OF ENVIRONMENTAL EDUCATION (EE)

The purpose of this section is to discus some of the major global conferences that guide and inform the incorporation EE at the global level. These historical developments have significant contribution to the development of EE at the local level. This discussion will focus on the origin of the key conferences, brief historical background of conferences and the major recommendations as well as the significance of these developments for this study.

3.3.1 The Stockholm Conference

The General Assembly of the United Nations (UN) decided to convene a UN conference on the Human Environment in the summer of 1972 (Von Weizsäcker, 1994: 14). This UN conference on the Human Environment held in Stockholm was the first major United Nations gathering to 'draw attention to the global nature of environmental crisis and to suggest that EE be used to shift the pattern of human development into a more healthy, just and sustainable trajectory' (Clover, 2000:

213). At the conference a number of concerns relating to the environment were presented. Fensham (1992: 61-62) notes these concerns as follows:

- The need to conserve rapidly dwindling resources must be associated with concern for the majority of the world's population which has not yet had its share;

- A minority of countries and of the world's population account for the majority of its energy consumption and produce most of its pollution;

- The physical and spiritual qualities of our relations to the earth needed improvement as much as the ecological health of our planet;

- The global nature of so many environmental problems was seen to need new forms of international cooperation. There was a call for education to focus its resources on the situation.

These developments are very significant because the concept of Environmental Education (EE) that is considered in the study stems from this conference. It can be noted from the excerpts above that 'education' was called to focus its resources on various environmental problems that were evident then. Secondly, the statements presented at this conference show that the planet is faced with some environmental problems that needed to be solved through an intervention. In the excerpts above it is shown that threats may be caused more by a small number of rich countries but their consequences are global in nature and need to be tackled collectively. International cooperation is acknowledged as one of the means that could be used to address those environmental problems. It is also emphasized that international cooperation could only be achieved when people in various countries understand the reasons for protecting the environment and the consequences of environmental degradation and have knowledge, values, skills and attitudes for preventing degradation. The incorporation of Environmental Education (EE) plays a significant role in achieving this understanding and reversing the catastrophic effects of environmental degradation. This explains why EE was recognized as one of the

means that can be used to tackle these threats to the environment because it empowers people to deal critically with issues, problems and crises.

3.3.2 The Belgrade Charter

Ponnia (1996: 25-27) and Da Silva (1996: 113) noted that through Recommendation 96, the Stockholm conference called on the United Nations (UN) forums such as United Nations Scientific and Cultural Organization (UNESCO) and United Nations Environmental Programme (UNEP) to jointly create an International Environmental Education Programme (IEEP). The IEEP, UNESCO-UNEP convened an International Environmental Education Workshop in Belgrade, former Yugoslavia from 13-22 October 1975 (Pace, 1996: 6). The Workshop that was attended by 100 educational specialists focused exclusively on environmental education. According to Clover (1996: 94), the aim of the workshop was to adopt the Belgrade Charter, a global framework for environmental education that established a plan of action as well as goals, objectives, audiences and principles of environmental education". These goals and objectives are stated below.

According to UNESCO-UNEP (1988: 12), the goals for EE are:

- To foster clear awareness of and concern about, economic, social, political and ecological interdependence in urban and rural life;

- To provide every person with opportunities to acquire knowledge, values, attitudes, commitment and skills needed to protect and improve the environment;

- To create new patterns of behaviors of individual groups and society as a whole towards the environment.

The categories of objectives of Environmental Education (EE) are noted by United Nations Scientific and Cultural Organization (UNESCO) and United National Environmental Programme (UNEP), (1988: 12) as follows:

- **Awareness:** To help social groups and individuals acquire an awareness of and feelings of sensitivity to the total environment and its allied problems;

- **Knowledge:** To help social groups and individuals acquire a variety of experiences in and acquire basic understanding of the environment and its associated problems;

- **Attitudes:** To help social groups and individuals acquire a set of values and feelings of concern for the environment and the motivation for actively participating in environmental improvement and protection;

- **Skills:** To help social groups and individuals acquire the skills for identifying and solving environmental problems;

- **Participation:** To provide social groups and individuals with an opportunity to be actively involved in working towards the resolution of environmental problems.

The most important significance of the goals and objectives shown above is that they reflect the knowledge, values, actions and attitudes that should be incorporated in an EE programme. These aspects must be generated in a participatory manner by introducing learners to work as individuals and in groups in order to avert the effects of environmental destruction. Secondly, these goals and objectives show that in the process of incorporating EE the political, social and economic dimensions of the environment should form the backbone of the educational process.

3.3.3 The Tbilisi Intergovernmental Conference on Environmental Education (EE)

Belgrade was followed in 1977 by the first intergovernmental conference on Environmental Education, held in Tbilisi, the capital city of Georgia, organized by United Nations Scientific and Cultural Organization (UNESCO) and attended by 66 member states (Neal & Palmer 1994: 13). The purpose of the Tbilisi conference was to promote policies that would lead to the incorporation of EE in the educational systems of various countries. This was also noted by Pace (1996: 11) as follows: 'while the Belgrade workshop was characterized by the participation of education experts, the Tbilisi's target was policy makers'. Secondly, the purpose of the conference was to promote and intensify thinking, research and innovation with regard to environmental education (Clover, 1996: 94). The purpose stated above was clearly demonstrated because "the Tbilisi declaration was adopted by the acclamation at the close of the intergovernmental conference" (Tbilisi declaration (n.d.) (www.**gdrc.org**/uem/ee/**tbilisi**.html). The Tbilisi declaration established a comprehensive theoretical framework for EE. It also endorsed the goals and objectives of EE postulated during the Stockholm conference. More importantly the declaration established "the framework, principles and guidelines for EE at all levels, local, national, regional and international" (Tbilisi declaration (n.d.) (http://www.gdrc.org/uem/ee/tbilisi.html). The principles serve as guidelines for the incorporation of EE inside and outside of the formal educational system.

According to the United Nations Scientific and Cultural Organisation (UNESCO) and the United Nations Environmental Programme (UNEP), the Tbilisi declaration worked out the following guiding principles of EE:

- **Consider the environment in its totality:** Including natural and built, technological and social, economic, political, moral, cultural, historical, and aesthetic;

- **Be a continuous life long process:** It should begin at pre-school level and continue through all formal and non-formal stages;

- **Be Interdisciplinary in its approach,** drawing on the specific content of each discipline to achieve a holistic and balanced perspective;

- **Examine major environmental issues** from a local, national, regional and international point of view so that learners receive insights into environmental conditions in other geographical areas;

- Focus on **current and future environmental situations**, while taking into account the historical perspective;

- Promote the **value and necessity of local, national and international cooperation** in the prevention and solution of environmental problems;

- Explicitly **consider environmental aspects in plans for developmen**t and growth;

- **Enable learners to have a role in planning their learning experiences** and provide an opportunity for making decisions and accepting their consequences;

- Relate to **environmental sensitivity, knowledge, problem-solving skills**, and **values clarification** to every age, but with emphasis on environmental sensitivity to learner's own community in early years;

- Help learners **discover the symptoms and real causes** of environmental problems;

- **Emphasize the complexity of environmental problems** and thus the need to develop critical thinking and problem-solving skills;

- Use **different learning situations and a variety of educational approaches** to teaching and learning about the environment, with emphasis on practical activities and first-hand experience (UNEP, 1977: 27).

The principles provide guidelines for the learners, the educators and explain the nature of Environmental Education (EE). They also have a direct link with the goals for curriculum development (see Chapter 2, section 2.5) because they promote EE knowledge, values, attitudes and action. With regard to the status of learners in EE, the principles ensure that learners should have a role in decision-making and in accepting consequences of their actions on the environment. They also ensure that learners' knowledge, values and skills are integrated in the educational process so that they can construct the real causes of environmental problems. These could be generated through participation in educational activities aimed at resolving environmental problems and crises. Regarding the status of the educator, the principles advise educators to use a variety of instructional models and to consider first-hand experience in the teaching of EE. The nature of EE (see Chapter 2, section2.3.2) is also alluded to in these principles. This is portrayed in these principles as an approach to all education that exists in all subjects.

3.3.4 The World Conservation Strategy

The World Conservation Strategy of 1980 is one of the significant documents that gave impetus to conservation and EE. The World Wide Fund for Nature (n.d.) states that the World Conservation Strategy was published by the International Union for the Conservation of Nature and Natural Resources (IUCN) in collarboration with the World Consevation Union, the United Nations Environment Programme (UNEP) and endorsed by the United Nations Secretary General. The WWF also emphasized that the strategy was launched simultaneously in 34 world capitals (http://www.panda.org/about_our_earth/about_forests/timeline_forest_conservation/). Harris & Blackwell (1992: X) maintain that the launch of the World Conservation Strategy in 1980 provided further impetus and a framework for thinking about the environment on a worldwide basis. Neal & Palmer (1994: 13) also added that "this key document stressed the importance of resource conservation through sustainable development". The dimension of sustainable development can be observed in the strategy because it requires and calls for a "new ethic, embracing plants and animals as well as people for human societies to live in harmony with the natural world on which they depend for survival and well being'' (Greig, Pike & Selby, 1987: 25). This source also shows

that EE was firmly stressed by the World Conservation Strategy. In this source it is stated that the "long term task of EE is to foster or reinforce attitudes and behaviour compatible with this new ethic" (Greig, Pike & Selby (1987: 25).

The above discussion shows that the World Conservation Strategy introduced the concept of 'sustainability' that is considered in this study. Secondly, the excerpt above also called for a new environmental ethic that is consistent with the conservation of dwindling resources. What is alluded to here is that the behaviour of people who live on this planet is destructive and was not consistent with resources available in the biosphere. In this context, Environmental Education (EE) has the role of transforming the behaviour that is not consistent with the new environmental ethic. Volk, Hungerford, & Winther, (1994: 254) concur that "additional thinking in EE seems to be that we can change behavior by giving people knowledge about the environment". In line with this notion of EE, the IUCN (n.d.) (http://www.iucn.org/en/about/) says that the mission of the World Conservation Strategy "is to influence, encourage and assist societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable". This study concurs that the incorporation of EE may help to achieve this mission.

3.3.5 The United Nations Report on the World Commission for Environment and Development

In 1987, the United Nation's World Commission on Environment and Development (UNCED) produced the report, Our Common Future (Bennett, (1993: 105); Neal & Palmer, (1994: 14). The World Commission on Environment and Development is widely known as the Brundtland Commission, named after its president, the former Prime Minister of Norway, Gro Harlem Brundtland" (Middleton; O' keefe & Moyo, 1993:16). As noted by Mitra and Hale (1993: 336) 'the term sustainable development entered widespread usage after the World Commission on Environment and Development published its report, Our Common Future'. It is noted by Stephenson (1996: 171) that 'the event marked the point at which the innate connection between environmental issues and development issues was firmly acknowledged at the international level'. It can be seen here that the publication of the report popularized

the notion of sustainable development but it also highlighted the need for EE as one of the methods that could empower individuals to solve the environmental problems and ensure sustainable development. The chairperson of the World Commission on Environment and Development (Bruntlandt Commission) in the introduction to the report wrote:

> "First and foremost our message is directed towards people, whose well-being is the ultimate of all development policies. In particular, the commission is addressing the young. The world's teachers will have a crucial role to play in bringing this message to them" (Gro Harlem Bruntland, Chairperson of the World Commission on Environment and Development cited in UNESCO 1991: 12).

The preceding discussion notes the introduction of the concepts of 'environment' and 'development'. It also accentuates the concept 'sustainability' that was defined in Chapter 2, section 2.2.2.3. The notion of this concept intends to introduce a harmonious relationship between the environment and development. In the excerpt above it is emphasized that people should receive the message pertaining to environmental protection and sustainable resource use (development). Relating the concept of environment to people brings the concept of Environmental Education (EE) into the debate. Therefore, the concepts of EE and sustainability used in this study are rooted in the message presented in the above discussions and excerpt because "EE has a role to play in helping people make informed personal and political decisions" (Clover 2000: 215). The personal and political decisions that may be made could bring the sustainable utilization of resources into the spotlight.

3.3.6 The United Nations World Conference on Environment and Development

The United Nations Conference on Environment and Development (UNCED) took place from the 3rd to 14th of June 1992 in Brazil, Rio de Janeiro (Neal & Palmer, 1994:14; Pace, 1996: 34; Clover, 2000: 213 and Diouf, 2002: 61). The major document to come out of the Earth Summit in Rio is the so called Agenda 21. Agenda 21 is touted (http://www.iol.ie/~isp/agenda21/watsa21.htm) as a "blueprint for sustainable

development into the 21st Century. Its basis was agreed upon during the "Earth Summit" at Rio in 1992, and signed by 179 Heads of State and Governments".

Education has its own chapter (chapter 36) in Agenda 21 (Moldan, 2002: 206). Alluding to this chapter, Clover (1996: 94) maintains that it "outlined a framework for education that incorporates environmental and developmental concerns, and put a stronger focus on non formal education. Additionally, Hale (1993: 92) states that 'chapter 36 of Agenda 21 observes that there is still a considerable lack of awareness of the interrelated nature of all human activities on the environment due to insufficient information. In view of the observation made, Agenda 21 of the Earth Summit (1992: 221) maintains that:

> Education, including non-formal education, public awareness and training should be recognized as a process by which human beings and societies can reach their fullest potential. Education is critical for promoting sustainable development and improving the capacity of the people to address environment and development issues.

The assertion shows the continuation of emphasis on the concept of sustainable development. Education is touted as the means for achieving sustainable development. Matsuura (2002: 27) notes that "Achieving sustainable development is a process of learning. Sustainable development requires committed, active and knowledgeable citizens". Additionally, United Nations Scientific and Cultural Oragnization (UNESCO, 2002: 4) maintains that in order to create awareness about the interrelated nature of all human activities on the environment as noted in Chapter 36 of Agenda 21, all governments should:

- Ensure that basic education and functional literacy for all is achieved;

- Make environmental and development education available to people of all ages;

- Integrate environmental and developmental concepts, including those of population, into all educational programmes, with analyses of the causes of the major problems;

- Involve school children in local and regional studies on environmental health, including safe drinking water, sanitation, food and the environmental and economic impact of resource use.

The assertion above maintains that education and functional literacy are included in the curricula of primary schools, secondary schools, and adult education phases. Education for Sustainable Development (ESD) should be a critical part of that curriculum. The analysis of major causes of environmental problems should be incorporated in the educational programmes. Furthermore, it is also asserted that the educational programmes should also effectively promote health issues, food security, environment and the economic impact of resource use. This is essential because poverty may be resolved through the educational process.

3.3.7 The United Nations World Summit on Sustainable Development

Following the Rio Summit, The United Nations (UN) General Assembly convened a World Summit on Sustainable Development that took place in Johannesburg, South Africa, in the year 2002. Following the Johannesburg Summit on Sustainable Development (n.d.) it was declared that:

> This high-level international event was convened by the UN General Assembly to provide renewed political impetus for a comprehensive effort to push forward the sustainable development agenda throughout the world and respond to the new challenges and opportunities that have arisen since 1992. (http://parallel.vub.ac.be/~jan/ ucos_conferentie/)

Although the Johannesburg Summit on Sustainable Development did not pay much attention to education, it was highlighted as an important mechanism for reaching the goals of sustainable development. There was a recommendation to the UN General Assembly to adopt a decade of education for sustainable development starting in

2005 (the World Summit on Sustainable Development (n.d.) (http://www.wssd-education.org.uk/jo-text.htm#jo1).The United Nations General Assembly adopted a resolution that from 2005 to 2015 will be a decade of Education for Sustainable Development (ESD). Mosidi (2003: 427) maintains that "United Nations Social and Cultural Organization (UNESCO) is also tasked to draft an international implementation scheme, clarifying its relationship with existing education processes with a view to provide guidance to governments to incorporate measures to promote Education for Sustainable Development (ESD)". Furthermore, UNESCO's website (n.d.) (http://www.unescobkk.org/education/esd/about-esd/good-practice) touts that 'ESD is based on the premise of "learning by doing". Each cultural/societal group will choose to address ESD in the context of its own aspirations for sustainable development. Thus, there can be no "one-size fits all" approach to ESD.

The Report on ESD that culminated from the above recommendation is not an isolated document. Therefore, it is asserted that UNESCO has prepared the report on ESD based on key lessons that stem from its role as task manager for chapter 36 of the Agenda 21, (UNESCO 2002: 5). The key lessons that have been learnt about ESD are noted as follows:

- Education for Sustainable Development is an emerging but dynamic concept that encompasses a new vision of education that seeks to empower people of all ages to assume responsibility for creating a sustainable future;

- Basic education provides the foundation for all future education and is a contribution to sustainable development in its own right;

- There is a need to refocus many existing education policies, programmes and practices so that they build the concepts, skills, motivation and commitment needed for sustainable development;

- Education is the key to the rural transformation and is essential to ensuring the economic, cultural and ecological vitality of rural areas and communities;

- Lifelong learning, including adult and community education, appropriate technical and vocational education, higher education and teacher education are vital ingredients for capacity building for a sustainable future (UNESCO: 2002: 5).

What can be deduced from the above pronouncements is that ESD is a new vision that seeks to empower communities and individuals to live sustainably. There is a strong emphasis on basic education because it offers opportunities to all youth to understand the basis of a sustainable future. There is a need to change educational policies so that they focus on Education for Sustainable Development (ESD) within basic education. There is also an emphasis on the reorientation of education in order to address sustainable development, the need for the provision of ESD in lifelong learning programmes and vocational education, higher education and teacher education in order to build capacity for all people in rural and urban areas. In this study, Environmental Education (EE) is recognized as a vital component of ESD.

3.4 PERSPECTIVES ON THEORIES OF MODERN ENVIRONMENTALISM FOR THE INCORPORATION OF (EE) FOR SUSTAINABILITY

This section discusses the theories of modern environmentalism that may guide the incorporation of EE in learning programmes. The theories discussed include the following: 'Deep ecology', 'Technocentrism and Ecocentrism' as well as the 'modes or theories of sustainability'. The discussion will focus on the characteristics and principles of each theory as well as the posture of the researcher on each theory with respect to the aims of the study.

3.4.1 Deep ecology

Deep ecology is the most expressionist theory of environmentalism that was first outlined in a 1972 lecture by Norwegian Philosopher Arne Naes (Szerszynski, 1996: 105). The concept 'Deep ecology' is often distinguished from 'Shallow ecology'. Palmer (1998: 86) shows 'Deep ecology' "fundamentally rejects the dualistic view of humans and nature as separate and different. It holds that humans are intimately

part of nature". This view treats human beings as equal to nature. The Great River Institute (n.d) maintains that "The concept of Deep ecology has been coined to refer to an ecology that goes deeper by placing humans within ecosystems. Human beings are only different but are not better or more valuable than other species" (http://www.greatriv.org/de.htm). Shallow ecology on the other hand considers that humans and nature are separate and that humans can dominate the world around them. This goes without saying that "human beings are the central species in the Earth's ecosystem, and that other beings and parts of systems are of less importance or value" (http://www.greatriv.org/de.htm).

One of the fundamental tenets of Deep ecology is the rejection of the so called Shallow ecology. Shallow ecology emphasizes resource depletion, affluence and the consumption of goods by people living in the developed world (Switzer, 2004: 45). Proponents of deep ecology subscribe to the following eight basic principles of deep ecology.

- The well-being and flourishing of human and non-human life on earth have value in themselves (synonyms: intrinsic value, inherent value). These values are independent of the usefulness of the non-human world for human purposes;

- Richness and diversity of life forms contribute to the realisation of these values and are also values in themselves,

- Humans have no right to reduce this richness and diversity except to satisfy *vital* needs;

- The flourishing of human life and cultures is compatible with a substantial decrease of the human population. The flourishing of non-human life requires such a decrease;

- Present human interference with the non-human world is excessive and the situation is rapidly worsening;

- Policies must therefore be changed. These policies affect basic economic, technological and ideological structures. The resulting state of affairs will be deeply different from the present;

- The ideological change is mainly that of appreciating life *quality* (dwelling in situations of inherent value) rather than adhering to an increasing higher standard of living. There will be a profound awareness of the difference between big and great;

- Those who subscribe to the foregoing points have an obligation directly or indirectly to try to implement the necessary changes to achieve the aims of Deep ecology (Devall & Sessions (n.d.) (http://www.eoearth.org/article/Deep ecology).

The principles of Deep ecology presented describe the preferred state of the environment and the conditions that are necessary for the attainment of that preferred state. The richness and diversity of life forms of nature is the preferred state that should be allowed to flourish. One of the conditions necessary for the attainment of this preferred state is the reduction of the human population and the incorporation of policies that place man and natural resources on an equal level.

The Deep ecology movement also reveals a negative picture on the present pattern of consumption, wealth creation and environmental destruction. These negative patterns are reflected in the dominant attitudes that have characterised consumption since the Second World War. The dominant attitudes (Table 3) are wasteful and are characterised by the domination of nature. Deep ecology values are characterised by equality and harmony with nature.

Table 3: Frontier economics vs Deep ecology

Dominant worldview (frontier economics)	Deep ecology
Dominance over nature	Harmony with nature symbiosis
Natural environment as resource for humans	All nature has intrinsic worth; bio-species equality
Belief in ample resource reserves	Earth 'supplies' limited
Material economic growth for growing human population	Elegantly simple materials needs: (material goals serving the larger goal of self realization)
Consumerism	Doing with enough/ recycling
National centralized community	Minority tradition: bioregion
High technological progress and solutions	Appropriate technology: Non-dominating science

Source: Devall and Sessions cited in Bartelmus (1994: 77)

Although the researcher mainly embraces the principles of deep ecology as the modern means of environmental protection, he also supports the critics of deep ecology that stems from socialists and eco-socialists. Barnhill (n.d.) http://www.eoearth.org/article/Deep_ecology maintains that deep ecology neglects the social dimension of environmental problems. The writer also argues that deep ecology overlooks the significance of authoritarianism, hierarchy and the nation-state as causes of environmental and social problems. The researcher is of the view that the deep ecology principles presented earlier has shortcomings because they only appreciate resources and therefore falls short of the development (human side) of sustainability.

The principles of deep ecology may be incorporated because they support sustainability of resources but their effective incorporation is hampered by the lack of the social dimension. In this study, the incorporation of Environmental Education (EE) in a cross-curricular manner is seen as an act of infusing and recognizing the social dimension. The social dimension that is emphasised in this context is that of educating and unfolding the state of nature and educating human beings so that they could embrace those values while benefitting from the resources on a sustainable basis.

3.4.2 Ecocentrism and Technocentrism

An alternative and more tightly defined set of distinctions and terms were developed by O'Riordan, (Palmer, 1998:89). Distinctions are Ecocentrism and Technocentrism**.** Ecocentrism sees humankind as part of the global ecosystem and is subject to ecological laws (Palmer, 1998: 89). It contends that human beings should be subject to nature rather than in control of it. Ecocentrists lack faith in modern technology and the bureaucracy attached to it. They will argue that the natural world should be respected for its processes and products and that low impact technology and self-reliance is more desirable than technological control of nature (http://www.ace.mmu.ac.uk/esd/Earth/Ecocentrism_and_Technocentrism.htm).

These principles of Ecocentrism presented above support the demand for natural resources that is based on environmental constraints. This view contrasts Technocentrism because the latter is a "mode of thought which optimistically believes that society can solve all environmental problems, using technology and science to achieve unlimited growth (Carter, 2001: 72). Technocentrics, including imperialists, have absolute faith in technology and industry and firmly believe that humans should have control over nature. Other authors maintain that "Technocentrics may accept that environmental problems do exist, but they do not see them as problems to be solved by a reduction in industry. Rather, environmental problems are seen as problems to be solved using science. Technocentrics contend that the way forward for developed and developing countries and the solutions to our environmental problems today lie in scientific and technological advancement. (**http://www.ace.mmu.ac.uk/esd/Earth/Ecocentrism_and_Technocentrism.htm**). A further distinction between Technocentrism and Ecocentrism is discussed in table 4.

Table 4: The distinction between Ecocentrism and Technocentrism

Ecocentrism		**Technocentrism**	
Gaiaism	**Communalism**	**Accommodation**	**Intervention**
Faith in the rights of nature and of the essential need for co-evolution of human and natural ethics	Faith in the co-operative capabilities of societies to establish self reliant communities based on renewable resource use and appropriate technologies	Faith in the adaptability of institutions and approaches to assessment and evaluation to accommodate environmental demands	Faith in the application of science, neglect forces and managerial ingenuity
Green supporters; radical philosophies	Radical socialists, committed youth, radical politicians, intellectual environmentalism	Middle ranking executives; environmental scientists; white collar trade unions, liberal socialist politicians	Business and finance managers; skilled workers; self employed; rightwing politicians; career focused youth
Demand for distribution of power towards a decentralised, federated economy with more emphasis on informal economic and social transactions and the pursuit of participatory justice		Belief in the retention of the status quo, in the existing structure of political power, but a demand for more responsiveness and accountability in political, regulatory, planning and educational institutions.	

Source: O' Riordan cited in Palmer (1998: 89)

The table above shows four dimensions that come under the label of Ecocentrism and Technocentrism. The dimensions shown in the ecocentric side of the table are considered here because they relate to sustainability. The researcher is of the opinion that these values of Ecocentrism could be realised through the provision of sound Environmental Education (EE). Education is a way of providing power so that people could participate in issues that pertain to their own development and improvement of the environment. According to Palmer (1998: 89) a renowned author known as Turner, K. R realigned theTechnocentrism and Ecocentrism dichotomy into four world views of modern environmentalism in 1988 as follows:

- '*Cornucopia' technocentrism*: an exploitative position supportive of a growth ethic expressed in material terms (e.g. GNP); it is taken as axiomatic that the market mechanism in conjunction with technological innovation will ensure infinite substitution possibilities to mitigate long-run real resource scarcity;

- *'Accommodating' technocentrism*: a conservationist position, which rejects the axiom of infinite substitution and instead supports a 'sustainable growth' policy guided by resource management rules;

- *'Communalist' ecocentrism:* a preservationist position, which emphasises the need for prior macro environmental constraints on economic growth and favours a decentralised socio-economic system;

- *'Deep ecology' ecocentrism:* an extreme preservationist position, dominated by intuitive acceptance of notions of intrinsic (as opposed to instrumental) value in nature and rights of non-human species.

The views presented above show the different approaches that characterise different solutions to environmental problems. These different approaches present a challenge that faces society to arrive at a consensus through a discussion about what is best not only for humans but also what is best for the rest of nature as well. The researcher is of the opinion that these values may not support sustainability that is considered in this study because there is no adequate inclusion of the human dimension. However, it is essential to articulate them in the Environmental Education (EE) classroom through environmental values education. This approach may enable learners to clarify these views, see their merits and demerits and re-state their own views that are balanced and inclusive of all components of sustainability.

3.4.3 Theories of sustainability

The concept of sustainability was already defined in Chapter 2, section 2.2.2.3. The purpose of this section is to further explore the concept by referring to the modes or types of sustainability that go along with the concept. This is important not only to demonstrate the scope of sustainability but also to distinguish sustainability that is considered in this study from other versions of sustainability. This section shall also state the most appropriate mode of sustainability that is relevant to the aims of this study.

It is clear that the consumption of natural resources in the environment rests on opposing modes of sustainability. These opposing modes of sustainability are accentuated in table 5. One mode of sustainability is known as 'sustainable growth'. Kotelniko (n.d.) maintains that "sustainable growth is a practical approach to achieving top-line growth and bottom-line results" (http://www.1000ventures.com/business_guide/sustainable_growth.html). This mode of sustainability is wasteful and is also synonymous with the 'business as usual' version of sustainability. The mode of sustainability ignores moral ethics pertaining to environmental protection. The other mode of sustainability is known as 'sustainable development'. This mode of sustainability does not only rest on principles of sustaining resources but also ensures the application of the moral ethics for the environment.

Table 5: The modes of sustainability

Sustainable growth	**Sustainable development**
Technocentrist	Ecocentrist
1. Essentially a technical concept	A broader concept embracing ethical norms, e.g. bio-ethics/ inter/ intra generational justice
2. Bound by formalistic rules of existing institutions	Requires new institutions to deliver
3. Social reform	Social revolution
4. Conservation one of several goals within an overall materials policy including waste recycling/ reduction	Conservation the sole basis for defining a criterion on which to judge policy/ alternative allocations of resources
5. three basic elements of policy: resource recovery/ recycling, residuals management, waste reduction	Policy derived from theories of e.g zero growth, steady state economy, bio-economic equilibrium, co evolutionary development
6. Requires a modified economics	Requires a new economics
7. Requires attention to the premises such as knowability and homeostasis	Requires attention to all four premises such as knowability, homeostasis, internal bio ethics and external bioethics
8. Core is reforming social systems to ensure reproduction of conditions of production	core is changing social systems to ensure popular control of livelihood or the conditions of production
9. Is manageable and politically acceptable because it is safely ambiguous	Is politically treacherous since it challenges the status quo
10. The 'greening of capitalism'	The 'greening of socialism'

Source: Turner and O'Riordan cited in Palmer (1998: 92). **Note: The researcher modified the characteristic in the seventh (7th) row.**

The mode of sustainability that is considered in this study is 'sustainable development' (see also Chapter 2, section 2.2.2.3). This mode of sustainability is considered in this study because it embraces the values of Ecocentrism and more importantly introduces the human dimension in the protection of natural resources. The human dimension ensures the adoption of strategies that supports the use of natural resources for the present generation while preserving and protecting them for the future generations. This can be achieved through environmentalizing or greening social activities and educating people.

This version of sustainability focuses on changing the social factors in order to ensure that sustainability takes effect. Achieving this goal would ensure that institutions are changed so that they deliver and influence the wider context to act according to those very principles and values of sustainable development

Second, it is stated that the mode of sustainability is treacherous because it challenges the status quo. The researcher views that the use of the concept treachery refers to the false view held by extreme anthropocentrists that conceive sustainable development as working against their interests while it, in fact, works to benefit their concerns. This is emphasised because the status quo that is challenged is one that threatens the very survival of humans and animals on this planet.

The other important concept that is alluded to in the table is popular control of livelihoods or control of production. The researcher is of the opinion that the use of the concept refers to Sustainable Livelihood Development (SLD) or Sustainable Living (SL). SLD is a variant of sustainable development that "may be traced to the World Commission on Environment and Development" (Midgley & Hall, 2001: 97). Other authors on this subject presented fundamental principles of SLD. These are:

- Regards its fundamental OBJECTIVE as meeting people's BASIC NEEDS;

- Employs SUSTAINABLE RESOURCE USE as the MEANS of meeting needs;

- Makes use of APPRORIATE TECHNOLOGY and encourages SELF RELIANCE;

- Draws on ECO-DEVELOPMENT strategies to ensure CONTEXT (location/ culture) specific variants of sustainable development;

- Generally requires STRUCTURAL TRANSFORMATION (DEMOCRATISATION) as an ENABLING CONDITION (Huckle cited in Palmer 1998:91).

The preceding section shows that Sustainable Livelihood Development (SLD) embraces the identification of livelihood related opportunities. These opportunities ensure that people draw resources from the environment while simultaneously protecting and maininatining the resource base. The Stockholm Environment Institute (SEI) (n.d.) (http://www.york.ac.uk/inst/sei/sustainability/livelihoods/_def.html) states SLD as an "approach ensures that the communities obtain food and cash to meet basic needs while maintaining the environment". This could take place through identification of basic needs, the use of appropriate technology in order to reach those needs and embracing the principles of sustainable development.

The other most important concept mentioned here is that of democratization and structural transformation. The researcher is of the opinion that democratization goes along with empowerment (skills transfer) and participation (involving) as enabling conditions. These concepts describe a participatory educational process. The concept of democratization seen in this context introduces and links the modes of sustainability to the aim (Chapter, 1, section 1.4) and content (Chapter 2, section 2.5) of this study. To incorporate Environmental Education (EE) is to democratize the people and also to give power that enables them to participate on matters pertaining to the development and sustainability of the environment, the economy and the society. This is only possible if the learners have knowledge, skills, values and attitudes characteristic of EE. These are characterised in this study as the resources that should be included in the educational and social environment.

3.5. PERSPECTIVES ON POLICIES AND KEY DOCUMENTS THAT GUIDE THE INCOPORATION OF EE FOR SUSTAINBILITY IN NAMIBIA

This section presents some perspectives on policy and key documents that have been drafted in Namibia in order to guide the incorporation of Environmental Education (EE). The background, key recommendations and relevance of each policy or key document to the aims of the study will be expressed. The researcher's view about how these key documents have been operationalised to support the incorporation of EE shall also be stated.

3.5.1 The Constitution of the Republic of Namibia

The Namibian Constitution has an article that relates directly to the protection of the environment and ensuring the sustainable utilization of natural resources. The inclusion of an article that relates directly to the environment in the constitution has been pioneered by the Namibian authorities. For example, the African Bird Club (n.d.) states (http://www.africanbirdclub.org/countries/Namibia/conservation.html) that "Namibia is the first country in the world to incorporate the protection of the environment into its constitution". Article 95 of the Namibian Constitution states that:

> The state shall actively promote and maintain the welfare of the people by adopting, interalia, policies aimed at maintenance of ecosystem, essential ecological process and biological diversity of Namibia and utilisation of living natural resources on a sustainable basis for the benefit of all Namibians, both present and future (The Constitution of the Republic of Namibia, 2007: 41-42).

The above excerpt shows that the protection of the environment is focussed on the welfare of the people. The welfare of the people will be determined to a large extent by a healthy balance of the ecological, biological diversity and utilisation of natural resources. The researcher deems the implications of this assertion as very crucial because people in Namibia use the ecosystems for settlement, cultivation and other economic activities such as mining, manufacturing, service provision and tourist attraction. A healthy environment and biological diversity guarantees the implementation of all economic and social activities.

As much as it can be noted that policies that maintain a healthy ecological process and biological diversity should be adopted and developed in Namibia as a constitutional obligation, it has equally emphasised that such policies would not be realised without educational intervention. The Namibian educational authorities also emphasised the incorporation of Environmental Education (EE) in the Namibian education system as one of methods to be used to generate knowledge, values and skills that would enable people to develop those policies that are called for by the constitution. Although there are many documents that call for the incorporation of EE as a constitutional obligation in Namibia, the Policy Document for EE in Namibia has been very explicit. This policy document stated that "Namibia will actively encourage and implement environmental education as a means of achieving and fulfilling article 95 of the constitution" (NEEN, 1999).

3.5.2 The National Policy on Education for All

The document entitled "Towards Education for All," was designed by the Ministry of Basic Education and Culture (MBEC,) "with direct and indirect assistance and co-operation of a great number of individuals and organisations" (MBEC, 1993: iii). In the opinion of the researcher, this policy document influenced the incorporation of EE in Namibia because it contains the aims that relate directly and indirectly to the incorporation of EE and sustainability to all the residents of Namibia. The aims that have directly supported the incorporation of EE in Namibia are noted as follows:

- Promote national unity, justice, liberty and democracy;

- Promote human rights, respect for oneself and respect for others, their cultures and their religious beliefs;

- Foster the highest moral, ethical and spiritual values such as integrity, responsibility, equality and reverence for life;

- Support and stimulate learners through childhood and youth and prepare them for responsibilities and challenges of adult life;

- Encourage perseverance, reliability, accountability and respect for the value and dignity of work;

- Develop literacy, numeracy, understanding of the natural and social environment, civic life, artistic appreciation and expression, social skills and promote physical and mental health;

- Provide knowledge, understanding and values and develop creativity and practical skills, as a solid foundation for academic growth or vocational training, and for a creative, meaningful and productive adult life (Ministry of Basic Education and Culture, 1993: 55).

The above goals list a number of broad statements of intent about desirable end results of Education for All in Namibia. One broad statement that stands out in support of the incorporation of education and sustainability in Namibia is to "develop literacy, numeracy, understanding of the natural and social environment, civic life, artistic appreciation and expression, social skills, and promote physical and mental health" (MBEC, 1993: 55). The message carried in this goal underscores the need to educate all people in Namibia so that they promote a harmonious relationship between different components of environment as well as physical wellbeing of the environment and mental wellbeing of the people in Namibia. The effort to reach the goals of Education for All through Environmental Education (EE) can also be measured by initiatives taken in Namibia to incorporate EE in all phases of school (refer to section 3.5.3) and sustainable development in all adult learning programmes (refer to section 3.5.5).

3.5.3 The Pilot Curriculum Guide for Formal Basic Education in Namibia

The Pilot Curriculum Guide for Formal Basic Education is a framework for piloting the new Basic Education Curriculum that was developed in Namibia at

independence by the Ministry of Basic Education and Culture (1996: 2). It was created to guide schools and teachers in the implementation of learner-centred education in Namibia. The curriculum guide was created through participation and involvement of educational experts and institutions at national forums that were convened by the Ministry of Basic Education and Culture. Amukugo (1993: 198) states that the Ministry of Basic Education and Culture launched the Etosha conference in 1993 where broad aims of reform were identified. She further asserted that the aims of reform were intended to promote schooling, enhance efficiency and improve of the quality of educational provision at various educational levels.

As the conference alluded to above developed broad aims of reform to promote schooling, efficiency and quality, it also developed aims that guide the incorporation of Environmental Education (EE). These aims are classified under subsection (3.10), that is entitled the Development of Environmental and Population Awareness. The researcher perused through the subsection of the Pilot Curriculum Guide for Formal Basic Education in Namibia and identified the following aims as having direct relevance to the incorporation of EE and sustainability in Namibia:

- Develop understanding of the dynamic interdependence of living and non-living things and the environment;

- Develop a sense of responsibility for restoring and maintaining ecological balances through the sustainable management of natural resources;

- Promote the learner's involvement in practical activities to preserve and sustain the natural environment, and;

- Lay a foundation for informed and responsible attitudes and choices towards the balance of population growth, ecological sustainability, and quality of life for all Namibians (MBEC, 1996: 8).

These aims mentioned above culminated into the introduction of various subjects that were recommended as carrier subjects for the incorporation of environmental

education in the Namibian education system. Table 6 shows some subjects that were recommended by the Ministry in the Pilot Curriculum Guide for the incorporation of Environmental Education (EE).

Table 6: Subjects recommended by the Ministry of Basic Education and Culture for the incorporation of EE in the Namibian Formal Education System

School Phase	Subjects used to teach environmental education
Lower Primary: Grades 1-4	Social studies, Environmental Studies, Natural Science & Health Education
Upper Primary: Grades 5-7	Social studies, Natural Science & Health Education, Religious and moral education (RME), Home Ecology, Elementary Agriculture
Junior Secondary: Grades 8-10	Geography, Home Economics, Business Studies, Development Studies, Life Science, Physical Science, History
Senior secondary: Grades 11-12	Geography, Natural Economy, Biology

Source: Ministry of Basic Education & Culture (1996) (Table is the researcher's)

As can be seen above, there are various subjects that were recommended for the incorporation of EE in different phases of the Namibian Formal Education Curriculum. The use of various subjects to incorporate EE is often described by the Ministry of Basic Education and Culture (1996: 27) as an integrated approach to EE. This approach includes the teaching of EE as a cross-curricular theme. The Ministry of Basic Education and Culture and the National Institute of Educational Development (n.d) maintain that introducing EE as a subject on its own would not be possible nor would it be desirable. The researcher supports this approach to the incorporation of EE because of the following reasons. First, such an approach to teaching incorporates the multidisciplinary and interdisciplinary model for the incorporation of EE (Chapter 2, section 2.4) and aims at improving the quality of teaching and learning of EE because it ensures that learners learn to apply their knowledge and skills in various subject areas.

In the view of the researcher, the integrated approach described above cannot be possible or be fully implemented if the teachers are not adequately trained to deal with this kind of programme. Therefore, it is emphasised here that teachers need to be trained in skills and arts for the incorporation of Environmental Education (EE) as an integrated theme. A further view that is held in this study is that a programme for the incorporation of EE should be based on the understanding, the perceptions and practices of the teacher educators in the Namibian Colleges of Education because they train the teachers.

3.5.4 Draft Environmental Education Policy for Namibia

The Environmental Education Policy for Namibia (1999) was prepared by a non-Governmental Organisation known as the Namibian Environmental Education Network (NEEN). The EE Policy for Namibia serves as the guide for the inclusion of environmental education in formal and non-formal environmental education in Namibia. The Environmental Education Policy for Namibia declares a number of fundamentals to Namibia's EE, namely:

a) Central to the concept of EE is the development of environmental literacy. This should assist in empowering all Namibians to regain control of their destiny through participation in decision-making at the local and national level

b) EE will place emphasis on:

- Stimulating dialogue and cooperation among individuals and institutions in order to create new lifestyles which are based on meeting everyone's basic needs regardless of ethnic, gender, age, religious, class, physical or mental differences in a sustainable fashion;

- Developing an ethical awareness of all forms of life with which humans share the planet;

- Recovering, recognising, respecting and utilising indigenous history and local culture, as well as promoting cultural, linguistic and ecological diversity;

- Recognising the interdependence of both living and non-living systems. Actions in one system can have effects on other parts of the system or other systems.

c) Namibia shall pursue an active programme to achieve sustainable living through inter alia, an active Environmental Education (EE) programme in accordance with the environmental education principles (NEEN, 1999)

The fundamentals shown above promote various approaches. One such approach is the use of EE to create new lifestyles based on meeting people's needs. In the view of the researcher, this approach to EE encourages the incorporation of sustainable development and sustainable livelihood strategies (subsection 3.4.3) in education. Additionally, interdependence is one principle of sustainable development that was alluded to in this discussion. This principle imposes the adoption of limitations that are imposed by the natural environment in the production and wealth creation process. The other approach is the recognition of indigenous history and local culture as well as promoting cultural, linguistic and ecological diversity. In the view of the researcher, this approach encourages the use of indigenous knowledge and resources to incorporate EE in order to generate a broad knowledge base that is needed to adequately solve the environmental problems. The third approach is about recognition of the ecological systems perspective in the incorporation of EE. Loubser (1997: 27) states that an ecological perspective is an ecology that studies the inter-relationship between organisms themselves and between organisms and their environment. Donald, Lazarus & Lolwana, (2002: 41) maintain that the ecosystem perspective is a blend of ecological and system theory views of human interactions between individuals and interactions between different levels of the social context. In the researcher's view the ecological perspective may also refer to the relationship between EE in the schools and the colleges of education as directly influencing each other. This means that a positive development for the incorporation of EE in the

Namibian Colleges of Education would also lead to effective incorporation of Environmental Education (EE) in the schools and communities.

3.5.5 The National Policy on Adult Learning

The National Policy on Adult Learning is important in the incorporation of EE because it emphasizes the need for environmental protection, poverty reduction and sustainable development. A review of the policy documents shows that it was created as a response to the Education for All Policy (section 3.5.4), the National Conference on Adult Education and some international initiatives that promote adult learning. The international initiatives include the Dakar Framework for Action which set Education for All, the United Nations Millennium declaration that set specific goals for development and the UN Literacy Decade Towards Education for All (2003-2012) that seeks to promote literacy among adults as well as youth (MBEC, 2003: 7). The MBEC asserted that with the introduction of the National policy on Adult Learning, the government seeks to promote the following goals:

- Economic growth and development;
- Equitable social development and poverty reduction;
- Sustainable environmental development;
- Participatory democratic development;
- Personal development and empowerment (MBEC, 2003: 17-18).

These goals reflect the inclusion of environmental management, sustainable development, participation and democracy in the economic and social development goals of the Republic of Namibia. Fincham & Thygesen (2002: 206) stated that 'we must recognise that integration is not only among disciplines and among people, but also that it lies at the heart of the notion of sustainable development'. Integrating the notion of sustainable development alludes to the use of Education for Sustainable

Development (ESD). Additionally, it was also stressed at the Fifth International Conference on Adult Education (CONFITEA V) in Hamburg 1997, that "today's adults must have the opportunity to develop their critical thinking skills and to use their ideas, knowledge, power and imaginations to begin to make change rather than simply maintaining the ecological status quo' (Fien, 2002: 125). The researcher agrees that presenting the content of ESD to adults enable them to have skills that would empower them to participate on issues of sustainability and in this way help cooperate with the learners, student teachers and colleges of education in the incorporation of Environmental Education (EE).

3.5.6 The Green Plan

Another policy document that shapes EE in Namibia is the Green Plan. The Green Plan was compiled by The Ministry of Wildlife, Conservation and Tourism (MWCT), now Ministry of Environment and Tourism (MET) and was presented by the former president Sam Nujoma at the UNCED conference held in Rio (Squazin, 1997: 34). This document demonstrated the commitment of the government of the Republic of Namibia to the protection and improvement of the environment and more importantly, the incorporation of EE into the school curricula. The Green Plan has a section entitled *Preparing for the Future: Education and Sustainable Development*. This section maintains, "Namibia's goal is to increase awareness and knowledge, and develop skills and attitudes amongst young Namibians conducive to a harmonious relationship with the environment" (The MWCT, 1992:100). The Green Plan also acknowledged the newness of the concept of EE in the educational structure.

The fact that EE was a new concept in 1990 and that the government of the Republic of Namibia demonstrated commitment to the protection of the environment gave a renewed interest to and left wide options to governing and non-governing authorities to make it part and parcel of every student's learning experience. In the view of the researcher this process should not only target schools but should also be focused on the Namibian Colleges of Education as well.

3.5.7 The National Assessment Report for the World Summit on Sustainable Development

Another document that influenced Environmental Education (EE) in Namibia is the National Assessment Report for the World Summit on Sustainable Development. The Johannesburg Summit on Sustainable Development was a conference where UN member countries were to report how far they had gone in incorporating environmental sustainability in their programmes. Therefore, in the year 2002, the Ministry of Environment and Tourism of Namibia prepared a document entitled the *National Assessment Report for the World Summit on Sustainable Development*. This report was presented to the world summit on Sustainable Development in Johannesburg, South Africa. The National Assessment Report for the World Summit on Sustainable Development made specific reference to Education for Sustainable Development (ESD) in Namibia as follows:

> Meeting the post-independence education challenges has been the biggest constraint to educating the public adequately regarding Agenda 21 issues. Efforts to coordinate EE in a structured and strategic way are now starting to emerge, with the development of formal and informal environmental education in Namibia in collaboration between Ministries of Environment, Education, NGOs and donor agents (Ministry of Environment & Tourism, 2002: 29)

As can be seen above, it was reported to the Johannesburg Summit that EE in Namibia faces some constraints and challenges. One of the challenges in the process of incorporating ESD was the historical legacy left by the former colonial government that the Namibian education authorities had to deal with. The colonial legacy is recognised in this study as a rationale for the incorporation of EE in Namibia (see Chapter 2, section 2.3.1). The excerpt also shows that the coordination of EE in a structured way is starting to emerge though formal and non-formal education channels. This assertion does not only show that EE is new but reveals that there are a "significant number of educators who may have the responsibility to deliver EE but do not have the necessary knowledge to do so" (Coetzer, 2007: 2). The incorporation of ESD considered here include the collaborative efforts of the Ministry of Environment, Ministry of Education, the donor agencies and other Non-

Governmental Organisations (NGOs) that are operating in Namibia. In the researcher's view, the effective coordination of the collaborative efforts of the Ministries, Donor Agencies and NGOs should be mobilised in order to enhance the effective incorporation of Environmental Education (EE) in the Namibian Colleges of Education.

3.6 SUMMARY

This chapter has uncovered the global theoretical perspectives for the incorporation of EE that took place from 1972 until the present time. It was shown that 'EE' originated in 1972 after the Stockholm conference while 'sustainability' became widely used after the United Nations conferences on environment and development. The historical perspectives also demonstrated the pluralistic, holistic, interdisciplinary and multidisciplinary nature of EE. The point of view held in this study supports the notion that EE could be adequately incorporated as a cross-curricular subject in the education system when the teacher educators in the Namibian Colleges of Education embrace the essential characteristics presented at the international level.

The chapter also discussed the theories of modern environmentalism that also shape the incorporation of EE. The modes of sustainability were presented in order to show the depth and breadth of the concept of sustainability. The modes that were discussed include Sustainable Growth (SG); Sustainable Development (SD) and Sustainable Livelihood Development (SLD).

The chapter also described policy perspectives and policy options developed in Namibia in order to support the incorporation of EE. These policies portray the theoretical positioning of the Namibian EE. The framework also shows how the Namibian authorities have embraced the international developments in the local context. The next chapter will describe the research methodology.

RESEARCH METHODOLOGY

4.1 INTRODUCTION

This chapter describes the methodology of research followed in order to address the aims and objectives and to prove the hypothesis of the study. The chapter will define the concept 'empirical research'. Following this is the explanation of the research design, direct and indirect data collection, population of the study and description of respondents, sampling strategy, validity and reliability of data as well the analysis of data. The so-called classical and grounded theory as well as some ethical considerations will be presented.

4.2 THE CONCEPT 'EMPIRICAL RESEARCH'

The union of the concepts 'empirical' and 'research' give rise to the concept empirical research that is adopted in this study. These concepts will be explained in order to demonstrate the context from which they are drawn and used in this study.

The concept 'research' was already defined in chapter one (1), section 1.6. 'Empirical' is derived from the Latin word *empiric(us)* which means 'experienced' (Slife & Williams, 1995: 67). From the meaning it could be stated that empirical research is the systematic inquiry that is designed to collect and analyse data using sense organs of sight, touch and smell. The information that is collected in the above manner is used to predict and understand an educational problem or to answer an educational research question. This interpretation of empirical research shows that it rests on observation and experience as means of data acquisition and interpretation.

Other authors content that 'empirical' research involves the asking of questions. For example, Bassey (1999:40) states that 'empirical' research is the process where questions are asked, observations made of events by researchers using their senses to collect data. This process of asking questions brings an interaction between the

researcher and the research participants. David & Sutton (2004: 363) defines empirical research as the "collection of data by various means rather than by drawing conclusions only from manipulation of theoretical propositions". In this study, the term empirical research is defined as the process of collecting information from a representative group of respondents using acceptable procedures, tools and techniques. The aim of 'empirical' research in this context is to produce knowledge about Environmental Education (EE) in the Namibian Colleges of Education.

In this study, many questions that will be asked (see annexure III) will revolve around or amount to one central research question (see Chapter 1, section 1.3). The act of asking questions in research is not an end but a means to provide an answer to the research question.

In order to answer the research question and to address the aim, objectives and hypothesis of the study, the study was designed such that it follows the design discussed below.

4.3 RESEARCH DESIGN

Research design is defined as "the specification of the most adequate operations to be performed in order to test specific hypothesis under given conditions" (Bless & Higson-Smith, 2000: 63). This definition of research design indicates that there are steps followed to solve and answer an educational problem or educational research question. Other authors define the concept research design by emphasising its purpose in empirical research. Hopkins (1980:47) maintains that the major purpose of the research design is to "develop a way to gather data that delivers clear messages and to choose proper techniques for picking up of those messages". This interpretation shows that research design enables the researcher "to determine what to look at, how to collect data and how to analyse it" (Hitchcock & Hughes, 1989: 79). In this study, research design is defined as the plan that is followed to collect research data, the approaches that are embraced including corresponding methods and techniques that are used to collect data that may provide an answer to the research question focused on the incorporation of Environmental Education (EE) in the Namibian Colleges of Education.

The research design in this study was done through the quantitative and qualitative research methods and techniques (Chapter 1, section 1.6). Below is the description of how this was operationalised in this study.

4.3.1 Quantitative research design

This study mainly embraces a quantitative research design (see Chapter 1, section 1.6). The quantitative research design in this study involves a plan to use the questionnaire as the main tool of data collection (see Annexure III). Babbie & Mouton (2001: 646) state that a questionnaire is a "document containing questions and other types of items designed to solicit information appropriate for analysis". The 'other items' alluded to in the above definition may be the demographic information and a statement that explains the purpose and objectives of the study.

The questionnaire was selected because it has specific advantages. The advantages are that the person administering the questionnaire has an opportunity to establish rapport, explain the purpose of study and explain the meaning of items that may not be clear. Questionnaires also ensure the availability of respondents in one place to respond to the questions asked. These advantages ensure efficient use of time and maintain the possibility of higher return rate of questionnaires (Best & Kahn, 1993: 232 and Munn & Drenver, 1996: 2).

Bailey (1987:123) states that a distinction is often made between open ended and close ended questions. Open ended questions are those questions in which the response categories are not specified. Respondents are free to state an opinion that relates to the subject or content of the questionnaire. Close ended questions have the response categories specified. The respondents should select one of those response categories. The questionnaire that was used in this study has both of these types of questions. Part A consists of ten (10) close-ended questions. Respondents were asked to select one response for each question. The close ended section has an additional option where respondents could add an unanticipated response if response categories presented may not be relevant to respondents'

context. Part B consists of one (1) open ended question. Respondents are free to state any opinion that relates to the field of Environmental Education (EE).

4.3.2 Qualitative research design

The study also embraces qualitative research (see chapter 1, section 1.6). The qualitative research design in this study involves the plan to use a tool and a technique in the empirical research process. The tool is the questionnaire described above (section 4.3.1). The qualitative dimension of the questionnaire was also embraced by the researcher through explaining and describing the data obtained and to present the meanings that participants attach to the information asked.

The qualitative research technique that was used to collect data is documentation. Documentation is perceived as the process of analysing documents in order to gather facts. It also refers to data such as records, policy documents, reports, news articles, journal articles, textbooks and speeches. Peil (1995:126) contends that documents are often very useful, very early in research, providing a background of what is known and helping in the development of useful hypothesis. In this study, the researcher operationalised this technique by reading and citing from books, journal articles, published and unpublished documents and Internet materials in order to provide background to the study and support the data collected.

4.4 DIRECT AND INDIRECT DATA COLLECTION

This study is a disciplined attempt to collect two sets of information. These are direct data sources and indirect data sources. Direct data refers to the information collected from the population of the study. This information answers questions about the problem of the study as well as the aims, objectives and hypothesis of the study. The collection of direct data started from the 2nd September 2008 and ended on the 3rd of October 2008.

Indirect data refers to the information that is collected from the libraries, resources and Internet sources. This is information that is cited throughout the body of the thesis. This set of data provides the background to the study and supports the

information on the topic of study. The collection of indirect data started in 2004 and ended in March 2009.

4.5 POPULATION OF THE STUDY

Identification, specification and description of the population of the study are crucial in research. Gay (1987:102) defines population as the group of interest to the researcher, the group to which she or he would like the results of the study to be generalizable. In this study, the population of the study is all the teacher educators in the four (4) colleges of education in Namibia. The components of the population of the study are described in section 4.6.

4.6 DESCRIPTION OF RESPONDENTS

4.6.1 The teacher educators

In the context of this study, teacher educators include all those academic or professional staff that creates a teacher education classroom through the provision of direct instruction to student teachers in the Namibian Colleges of Education. Teacher educators are the main respondents of the study. Direct data was collected from the teacher educators.

4.6.2 The Librarians

Indirect data was collected from libraries. This was done by visiting libraries in Namibia and South Africa but more importantly the researcher got support by interacting with the librarians from the University of South Africa (UNISA), University of Namibia (UNAM), Polytechnic of Namibia (PoN) and the National Library in Namibia. The other Resource Centres that were used are the Rössing Foundation Resource Centre, National Institute of Educational Development (NIED) and the Resource Centre of the Ministry of Education and Culture (MEC).

4.7 SAMPLING STRATEGY

The term ‘sample’ refers to people chosen from the population for the purposes of study. These respondents should be selected in a manner that is representative of the population. The ‘sample’ was chosen representatively from the population and respondents described in 4.6 and 4.6.1 respectively. In choosing the sample, the researcher embarked upon a process of ‘sampling’. Gay (1987:101) defines sampling as “the process of selecting a number of individuals for a study in a way that represent the larger groups from which they were selected”. This definition shows that sampling is preceded by careful thought. Other definitions refer to sampling as a “procedure through which we pick out, from a set of units that makeup the subjects of study” (Corbetta, 2003: 211). The term ‘sampling strategy’ used in this study refers to the way or manner in which individuals or respondents were selected from the population. The section below explains the types of sampling and shows the manner in which the ‘sampling types’ were operationalised in this study.

Sampling is categorised into probability sampling and non-probability sampling (David & Sutton, 2004:150- 152). Probability sampling is further divided into four (4) different types of sampling. The first (1st) type of probability sampling is simple random sampling. This type of probability sampling involves randomly selecting respondents from a sample. The word ‘random’ in this case refers to the selection based on a formula that gives all respondents an equal chance to be selected. The second (2nd) type is systematic sampling. This is a sampling technique in which the researcher defines the sample, decides on the sample size and then works out the number of respondents to be chosen for the study. The next type of probability sampling is stratified sampling. Stratified sampling is designed to produce a more representative sample. In this probability sampling type, respondents are chosen according to the characteristic variable such as gender, social class and age group or ethnicity. The last category of probability sampling is cluster/ multi cluster sampling. This technique involves selecting a sample based on specific and natural groups occurring within a population (Huysamen, 1994: 41-42; Babbie & Mouton, 2001: 190-193 and David & Sutton, 2004:150-151).

The non-probability sampling is also subdivided into four (4) types. First (1st) type is convenience, availability and opportunity sampling. This is a sample that is selected for ease of access. The second (2nd) type of non-probability sampling is quota sampling. Quota sampling involves selecting cases by opportunity and according to the pre-determined characteristics of the group. The predetermined characteristics may be ethnicity, race and social class. These pre-determined groups are known as quotas and should reflect the profile of the population. The next type of non-probability sampling is purposive sampling. This is a selection of a unit according to the researcher's own knowledge and opinion about which respondents are appropriate to the topic area. The researcher may decide to choose certain respondents in the population because he/she believes that they posses certain knowledge and skills vital for the study. The last type of non-probability sampling is snowball sampling. This is a technique based on social networking. It involves establishing contact with some respondents and then asking those respondents to put the researcher in contact with other respondents that may be vital for the study (Huysamen, 1994: 43-44; Babbie & Mouton, 2001: 166-166 and David & Sutton, 2004:150-151).

In the context of this study, the systematic sampling and the multi-stage sampling procedures were applied as the means of selecting respondents from a larger population. The section below explains how these types of sampling were applied.

The first (1st) stage was to establish the number of teacher educators in all the colleges of education. This information was obtained from the Vice Rectors of each of the colleges of education. At the time of obtaining this information, the researcher found that there were twenty seven (27) teacher educators at the Caprivi College of Education; sixty (60) teacher educators at the Ongwediva College of Education; thirty three (33) teacher educators at the Rundu College of Education and fifty two (52) teacher educators at the Windhoek College of Education. This brought the total to one hundred and seventy two (172) teacher educators in all the four (4) colleges of education. The purpose of this exercise was to work out the fraction such that the researcher reaches, at least, forty percent (40%) of the teacher educators in the Namibian Colleges of Education. This brought out a fraction of about sixty four (64) respondents from the four colleges of education. However, this number of

respondents was reached because a total of sixty four (64) questionnaires from the teacher educators in the Namibian Colleges of Education were received.

The second (2nd) stage was to select the department from which the respondents should come from. This stage was crucial because colleges consist of teaching and non-teaching departments. The non-teaching departments were not considered for the study and sampling. The teaching departments that were identified are the Department of Mathematics and Integrated Natural Sciences, the Departments of Languages and Social Studies, the Department of Prevocational Studies and Agriculture, the Departments of Lower Primary Education and the Department of Education Theory and Practice.

The third (3rd) stage was to select components of each department. For example, the Department of Languages and Social Studies consists of English, a number of Namibian languages such as Oshikwanyama, Oshindonga, Silozi, Rugxiriku, Timbukushu, Romanyo and Afrikaans as well Social Studies. A minimum of three (3) respondents from each component in departments of the colleges of education were selected. Care was taken to ensure that teacher educators teaching first, second and third year level of the Basic Education Teacher Diploma (BETD) course in the Namibian Colleges of Education were selected. This approach was employed so that the researcher could to tap the experience of teacher educators regarding the incorporation of EE across departments, subject areas and year levels.

The fourth (4th) stage was to distribute questionnaires to those selected in the various components of the departments. The questionnaires were channelized through the respective Heads of Department so that they could be traced easily.

4.8 VALIDITY OF DATA

Research is the pursuit of valid knowledge. According to Mouton (1996:30) “the notion of validity captures the idea that a statement or collection of statements can in fact be more or less truthful”. This statement shows data that may be collected from a sample of population may present a correct picture of reality being studied or may fail to portray the reality accurately. Walsh, (2001: 15) contends that the concept

validity “refers to the issue of whether the data collected is a true picture of what is being studied”. This definition shows that for data to be valid it must accurately portray the reality of the phenomena being studied. David & Sutton (2004: 28) capture the logic of this explanation by referring to validity as the “closeness of fit between data and reality”. This study defines validity in terms of sets of direct data that reflects the true reality of Environmental Education (EE) in the Namibian Colleges Education.

A study of literature shows that validity is a complex concept which “has many different facets” (Rosnow & Rosenthal, 1996: 130). This study briefly explains the different facets of validity in order to unfold how they are perceived in this study and also show how the study operationalised them. The first (1st) facet considered is face validity. Face validity refers to the appearance of a questionnaire, test or instrument of data collection. Face validity shows whether the appearance of a questionnaire measures what it purports to measure. The second (2nd) facet is construct validity which refers to the logical relationships between two variables. This facet of validity shows the extent to which the constructs of theoretical interest are successfully operationalised in research. In this study, it refers to the extent to which the questionnaire successfully collects data in order to reach the aims of the study and to prove the hypothesis of study that was formulated beforehand. This facet of validity also explores the extent to which the theoretical approaches such as the classical and the grounded theory have been operationalsed in this study. The third (3rd) facet is criterion validity which is conceived in this study as the degree to which the questionnaire correlates with the acceptable study criteria. This facet ensures that correct procedures are followed in the data collection process. The fourth (4th) facet is content validity which refers to whether questionnaire items represent the kind of material they are supposed to represent. In this study, it refers to whether the content of the questionnaire items represent the correct EE content that should be measured in order to reach the aims and objectives of the study. The fifth (5th) facet is statistical validity that captures the extent to which the study has used appropriate design and statistical methods of analysis. The sixth (6th) facet of validity considered in this study is ecological validity. Ecological validity refers to the appropriate research environment chosen to conduct the study. The next facet of validity considered here is interpretive validity. Interpretive validity is the extent to which

appropriate conclusions are drawn from data. The last facet considered here is convergent validity. It refers to whether a number of measures that purport to measure the same things point in the same direction. The opposite of convergent validity is discriminant validity. The latter facet of validity is about whether measures that are supposed to measure different things come up with different outcomes (Huysamen, 1994: 112-117; Babbie & Mouton, 2001: 41; Hoyle, Harris & Judd, 2002: 31-32 and David & Sutton, 2004: 171-172).

These different facets of validity have been operationalized in the study by designing the content of the questionnaire in order to measure and reflect the main aims and objectives as well as the hypothesis of the study, by following ethical procedures to collect data, by selecting a larger sample from the population, by choosing a statistical instrument that best portrays the results of study and by drawing conclusions that are grounded on the results of the study. Many of these facets of validity are portrayed through the instrument of data collection and are also expressed throughout the content of this thesis.

The other facets of validly that are important in this study is internal and external validity. These two facets of validity are crucial in this context because the study collects data from a sample that is smaller than the population (see section 4.7). The section below defines internal and external validity; presents the threats to internal and external validity and suggest measures taken by the researcher to minimise the threats and maximise internal and external validity of data.

4.8.1 Internal validity of data

Internal validity of data is an important consideration in this study. Gomm (2004: 39) says that “internal means that this is true for this experiment and would probably be true if it were repeated in the same format”. The experiment here relates to the empirical research that was being conducted. It entails that data collected should accurately capture a true reality from the respondents. Merriam (1998: 201) states that internal validity deals with questions of how research findings match with reality. This study aims to give an accurate picture of Environmental Education (EE) in the Namibian Colleges of Education because a “study that does not have some degree

of internal validity, its results will be questionable" (Mason & Bramble, 1989: 105). In this study, internal validity refers to the accurate representation of EE in the Namibian Colleges of Education.

There are different types of threats that could influence the results of a study. In this study, they are referred to as internal threats to validity. The following is a list of some of them:

- History refers to current events taking place during the experimental period. It is assumed that the longer the experimental period, the greater the possibility that change can happen to the respondents in the study area;

- Subject growth and development include the physical, emotional and cognitive maturational changes occurring in subjects and the periodic fluctuations that occur in human responses because of fatigue, hunger, illness or excitement;

- Subject selection refers to the influence that improper or biased selection has on results;

- Testing refers to positive and negative influences of pretests on the results. A researcher who gives a test beforehand to some group of respondents could observe that they (respondents) tend to earn higher scores when they take that test for the second time. In this context, this threat to internal validity could take place when a researcher gives instruction about the qustionnaire content and suggests possible answers to them. He then hands the questionnaire to the respondents in order to complete it;

- Instrumentation is the influence of unreliable instrument on the study. This happens when there is change in instrument used for data collection. It also has an effect when the observer become too tired, bored or use a

different instrument to collect data;

- Attrition and maturation refers to the loss of subjects during the experimental period. This takes place when subjects grow tired, hungry and withdraw from the study because the study period has taken long;

- Interaction refers to the effect of several factors on each other. This threat to internal validity happens when factors such as instrumentation, selection and loss of subjects combine to affect the internal validity of data (Hitllemon & Simon, 1997: 178 and Vogt, 2007: 122-124).

It can be observed from the above threats to internal validity that they relate to the researcher, the tools and techniques, the subjects or respondents of research as well as the environment or research context. In order to ensure internal validity of data, the researcher employed the following strategies in this study:

The threats such as loss of subjects, interaction and selection were counteracted. In this study, the loss of subjects could have created a lower return of questionnaires because of withdrawal from the study. Selection refers to choosing respondents that do not represent the college or are not teaching any subject at the colleges of education. This act may reveal a selection criterion that is biased. Interaction refers to the combination of all of these factors. In order to counteract these threats the researcher shortened the data collection period with the permission of the relevant authorities. The completed questionnaire was expected to be given back within five (5) days. This minimised the possibility or likelihood of changes taking place in the respondents or withdrawing from the study. The second approach was triangulation. Triangulation entails the use of multiple investigators, multiple sources of data, or multiple methods to confirm the emerging findings (Merriam, 1998: 204). In this study, the researcher adopted triangulation because multiple agents were asked to help with data collection through questionnaire distribution and monitoring. The senior and ordinary members of staff from the colleges were asked to help the researcher in the monitoring, distribution and collection of the questionnaires.
In this study, current events relate to strikes or parties occurring during the collection

of data. Subject development and growth refers to changes such as fatigue, hunger and acquisition of new information during data collection period. To counteract these threats the researcher ensured that data collection takes place in the shortest possible time and also urged respondents to be as honest as possible. The researcher also urged them to complete the questionnaire at the time that fits them.

4.8.2 External validity of data

External validity of data is an important consideration in this study. Rosnow & Rosenthal (1996: 136) states that external validity refers to the generalisability of a causal relationship to circumstances beyond those experimentally studied by the scientist". In this context the 'experiment' refers to the study that is being conducted in order to generate the findings. The findings generated should have external validity. Tredoux & Smith (2006: 165) contend a research study has external validity if its results are generalisable to other situations and/ or representative of a broader population. In this study, external validity refers to the results of the study that is representive and generalizable to the larger segments of the population represented by the sample.

There are different threats that could influence the generalizability of the study. In this study, they are referred to as the threats to external validity. Below is the list of some of the threats to external validity:

- Sampling is the selection of respondents from the population of the study. Threats may take place if selection was narrow or does not reflect the population of study;

- Selection treatment interaction refers to selection procedures that produce a sample that is either positively or negatively biased towards the study. This threat refers to selecting respondents because of prior experiences, learning and personality factors. This may be groups that are special and do not demographically represent the larger population;

- Reactive effects of experimental arrangements take place when the setting of the investigation is different from the real life setting. This is also known as ecological validity. It ensures that the environmental context of those selected should be representative of the larger population;

- Multiple treatment interaction takes place when a similar study is being undertaken with the same group in similar circumstances;

- Researcher effects are influences imposed by researchers themselves. This takes place when the researcher sensitizes those selected for the study about possible responses that should be given to research questions. It may also mean that the researcher selects a sample of respondents that is special and not reflective of the larger population (Best & Kahn, 1993: 144-145; Bieger & Gerlach, 1996: 82-84 and Tredoux & Smith, 2007: 178-179).

It can be observed that the threats to external validity relate to the researcher's treatment of respondents, as well as the sample that is representative of the larger population. The researcher employed the following strategies in order to counteract threats to external validity. Firstly, is ensuring that the sample was large enough to be representative of the population (see section 4.7, page 89). The researcher decided to visit all four (4) colleges of education and choose the sample from all of them (refer to section 4.7). Secondly, the focus of study (see chapter 1, section 1.8) lends itself to generalizability because the environment, the curriculum and methods in the Namibian Colleges of Education are believed to be similar.

4.9 RELIABILITY OF DATA

Reliability is important in this study because it determines the quality measurement instrument (Muijis, 2004: 71). A review of literature shows that the different definitions of the concept reliability point to one meaning. For example, Mouton

(1996: 144) states that reliability refers to the fact that different research participants being tested by the same instruments at the different times should respond identically to the same instrument. Merriam (1998: 205) states that reliability refers to the extent to which research can be replicated. In this study, reliability refers to repeatability. Repeatability means that teacher educators teaching similar subjects in different colleges of education should have similar responses to similar questions because they have similar curriculum content.

There are different forms that could be used to judge the reliability of a study. The forms of reliability and how they apply in this study are explored below:

- Inter-rater reliability is the extent to which two or more raters disagree. In this context it refers to the extent to which respondents teaching similar subjects in different colleges of education respond to the same questions of the questionnaire;

- Test re-test reliability is the extent to which two administrations or versions of the test or experiment measures or gives the same results. This form of reliability is applicable because the same questionnaire will be administered in different colleges at different times;

- Internal consistency reliability is applicable to the instrument of data collection. It measures the degree to which parts of a test or item in fact measure a single construct. This form of reliability has two types. First is split half reliability. This means that the test is split into even or odd items and calculates the respondents' scores on each 'half test'. The other is coefficient alpha which is a measurement of a coefficient. If the measurement is above 0.7 then one could say that the measure is reliable (Hoyle, Harris, & Judd, 2002: 83- 84; Muijis, 2004: 73 and Vogt, 2007: 114).

It can be concluded from the above forms of reliability that it may be realised by the researcher's instruments and the respondents. In this study, the concept of reliability

is explored alongside validity. Reliability affects validly: the lower the reliability, the less validity the test will have (Mason & Bramble, 1989: 273).

One measure that was taken into account to ensure the reliability of data includes test re-test reliability. The test re-test reliability is used here because the researcher collects data from the four (4) colleges of education using the same instrument. The researcher shall examine the repeatability of such results by comparing responses of respondents collected from all colleges of education.

4.10 ANALYSIS OF DATA

A range of data will be collected using the tool described in section 4.3.1. It will be analysed and accurately stored. According to Gay (1987: 334) a range of "collected data must be accurately stored, if appropriate, and systematically organized in a manner that facilitates analysis". The data that is collected should be coded and then entered into a computer programme known as the Special Package for Social Sciences (SPSS). Section 4.10.1 explains how data was analysed.

4.10.1 Close ended questions and open ended questions

There are two types of questions in the questionnaire that were considered for analysis (see section 4.3.1). The ten (10) close-ended questions were coded and stored in the SPSS programme for analysis. The frequency tables that are drawn from the SPSS programme are shown in annexure III. This data shall be transformed into bar graphs and multivariate tables. There is one (1) open-ended question in the questionnaire that was analysed. Responses to this question show a number of divergent and convergent responses. There researcher grouped the responses into seven (7) response groups. These ideas were put in the frequency table to show the number of teacher educators who fall in a specific response group. Although the table is statistical in nature, the emphasis of the analysis is on qualitative understanding.

4.10.2 Chi- square test

Chi-square is a test of significance that is used extensively in this study in order to compare and contrast the multidimensional sets of data obtained from the respondents. Chi-square is symbolized as (X^2) and it is used to "compare the proportions actually observed in a study to the proportions expected, to see if they are significantly different" (Airasian & Gay, 2000: 503). Best & Kahn, (1998: 415) state that a chi square (X^2) test "applies only to discrete data, counted rather than measured values". These authors contend that the X^2 is used to "estimate that some factors other than chance (sampling error) accounts for apparent relationships".

The above definitions show that X^2 consists of observed frequencies and expected frequencies. Ary, Jacobs & Razavieh (1979: 162) explain that observed frequencies are actual frequencies obtained by observation while expected frequencies are theoretical frequencies, which are used for observation. In order to apply the X^2 test in this study, the researcher shall compare responses obtained from the teacher educators through the use of departments of the Namibian Colleges of Education. The purpose of this exercise is to determine whether there is significant relationship between the departments in which teacher educators are located and their dispositions, awareness and attitudes regarding the incorporation of EE as a cross-curricular theme in the Namibian Colleges of Education.

4.11 CLASSICAL AND GROUNDED THEORY

This study is rooted in the "classical" and the "grounded" theory approaches (Bailey, 1987: 52; Straus & Corbin, 1996: 7 and Straus & Corbin, 1998: 158). The sections below explain the meaning of each theory and shows how each theory has been operationalised in this study. This explanation also reflects the difference between grounded and classical theory.

A classical theory is seen as an approach to research whereby the researcher follows stages. Accordingly, there are three stages that are followed. Stage one (1) consists of defining a problem. This stage also involves concept formation and constructing of propositions. During this stage a testable hypothesis is written and

presented. Stage two (2) consists of devising ways to measure the concepts empirically. Stage three (3) consists of gathering and analysing data. This stage is the process of verification of the hypothesis (Bailey, 1987: 52-54).

The implementation of this theory can be observed because the study developed the statement of the problem, stated the aims and objectives as well as the hypothesis of the study (Chapter 1, section 1.3 - 1.5) and collected information using research approaches (Chapter 1, section 1.6). This process was complemented by going to the field in order to gather information and verify the hypothesis.

Grounded theory is an approach in which the researcher draws conclusions from the research data that he or she has collected. Gall, Borg & Gall (1996: 10) confirms this assertion by stating that "the grounded theory approach involves drawing of constructs and laws directly from immediate data that one has collected rather from prior research and theory". These authors furthermore stated that the constructs and laws are grounded in a set of particular data that the researcher has collected. Straus & Corbin (1998: 158) also state that the grounded theory is a "general methodology for developing theory that is grounded in data systematically gathered and analysed". In the researcher's understanding, this approach means that one should firstly collect data and then base his/her propositions and suggestive recommendations on the data that is collected from the field.

In order to implement this theory in this study, the researcher collected information using a questionnaire. The recommendations that are made in this study are based on data collected from the research participants. In other words, the recommendations will be grounded on the data collected from the field respondents.

4.12 ETHICAL CONSIDERATIONS

The empirical research process takes some ethical considerations into account in designing the study and recruiting respondents. Anderson (1998: 17) maintains that all people involved with research, the research community, the funding agencies, governments and the public share certain common concerns. The ethical

considerations raise several general concerns which must be addressed by the researcher. Scheyvens, Nowak & Scheyvens (2003: 140) states that ethical considerations do not determine how successful the researcher will be but rather whether the research is just or not and the extent to which the research takes the participants needs and concerns into account. In this study, ethical considerations are viewed as all the measures that are taken by the researcher to ensure that the acceptable rules of conduct are followed.

Some of the ethical considerations in research are listed below:

- Informed consent has been obtained and appropriately documented. Informed consent in this context means obtaining permission from the educational authorities to carry out the study. It also refers to obtaining permsison from participants to take part in the research process;

- Confidentiality and anonymity refers to the process in which the researcher does not disclose the identity of the research participants. This means that personal details of research participants are not recorded and disclosed;

- Risks to participants are minimized by research procedures that do not unnecessarily expose them to risk. There are various risks that may be incurred. These include physical, emotional, and professional risks. In this context, physical risks refer to inflicting harm on the research participants. Emotional risks refers to humiliation that the researcher may impose on the research participants while professional risks means taking respondents away from their professional duties without appropriate permission;

- The rights and welfare of participants should be adequately protected. The rights that should be taken into account in this regard pertain to withdrawal from the study;

- Honesty and trust refers to all actions embraced to avoid deception, restoring a sense of equality between the researcher and research participants;

- Conflict of interest ensures that research is based on the relationship between participants. The participants that are included in this study are the funding agencies and other professional bodies. All of these participants set rules and regulations that should be observed to ensure that conflicts of interest are minimised (Anderson, 1998: 17; O'Leary, 2005: 71-73; Scheyvens, Nowak & Scheyvens, 2003: 141-147 and Punch, 2006: 55-57).

The preceding section presents some of the ethical considerations. This study operationalised them as follows:

Firstly, the researcher wrote a letter to the Ministry of Education and Culture in order to seek permission to carry out the research in the four (4) colleges of education (see annexure I). The letter explains the aims and objectives of the study and also states how the researcher intends to conduct himself during the data collection process. It is noted in the letter of grant of permision that the Ministry of Education and Culture (MEC) gladly welcomed this study (see annexure II).

Secondly, the researcher visited the colleges of education and presented the letter of grant of permission from the Ministry to the Rector of each college. A verbal discussion about the aims of the study was also initiated with each of the Rectors of the colleges of education. The discussion also explored the best ways in which data could be collected at the colleges without affecting routine tasks. The discussion also revolved around the sampling criteria of respondents from departments. It was also stated that only teacher educators who were willing to participate in the study would complete the questionnaire.

The confidentiality and anonymity of the respondent's identity was firmly established by assuring the participants that no efforts will be made to reveal their identities or to link them to their views.

The researcher did not expose the participants to risks and also made sure that their rights are well protected. The researcher asked respondents to complete the questionnaire at the time that was suitable to them. The other right that was

respected involved the right to refuse to take part in the questionnaire completion process and the right to withdraw from the study.

The researcher also ensured that the respondents have a sense of ownership and control over the data that was collected. In order to reach this ethical consideration, the researcher obtained help of a local staff member at each of the colleges of education. The researcher also promised that the results of the study would be available to libraries of the University of South Africa (UNISA, the University of Namibia (UNAM) and the Ministry of Education and Culture (MEC) and the National Institute of Education Development (NIED) resource centre. Participants could go to any of those libraries and resource centres and borrow a copy of the thesis.

The researcher also tried to create a sense of honesty, trust and ensured that there was a good return of the questionnaire. A personal communication and rapport with the respondents was established. Each of the four (4) colleges of education was visited.

4.13 SUMMARY

This chapter has introduced the methodology of research. The concept of empirical research was defined. The chapter also explained the research design. The qualitative and quantitative research tool and technique have been explained.

Other components of the research methodology that have been discussed in the chapter include direct and indirect data collection, population of the study, description of respondents, sampling strategy, analysis of data, validity of data as well as reliability of data. The grounded and classical theory approaches that were embraced in the study were elaborated. The chapter also discusses some of the ethical considerations that were taken into account when research data was collected and analysed.

The next chapter presents the results of the study.

PRESENTATION OF THE RESULTS OF THE STUDY

5.1 INTRODUCTION

This chapter discusses the results of the study. It is divided into five (5) parts. The first (1st) part presents the demographic information which includes the colleges of education, departments and the subjects taught by teacher educators who completed the questionnaire. The second (2nd) part discusses the incorporation of Environmental Education (EE) curriculum goals in the Namibian Colleges of Education. Results displayed in this section cover the incorporation of the four (4) EE curriculum goals in the Namibian Colleges of Education. These are ecological foundation, conceptual awareness: issues and values, investigation and evaluation and environmental actions (see Chapter 2, section 2.5.1- 2.5.4). The third (3rd) part discusses teacher educators' understanding, awareness and interpretation of the concept cross-curricular teaching as a model for the incorporation of EE in the Namibian Colleges of Education (see also Chapter 2, section 2.4). Following this part is the presentation of reasons for not incorporating EE and conditions that would facilitate the incorporation of EE in the Namibian Colleges of Education. The last part presents the teacher educators' final comments regarding the incorporation of EE in the Namibian Colleges of Education.

5.2 DEMOGRAPHIC INFORMATION

Part one (1) of the questionnaire was concerned with demographic information. The purpose of this part was to ascertain the colleges that were visited and returned the questionnaire. This part consists of three (3) questions.

The first (1st) demographic question asked about the institutions at which the teacher educators work. The results to this question are indicated in figure 2.

Figure 2: Institutions where teacher educators work

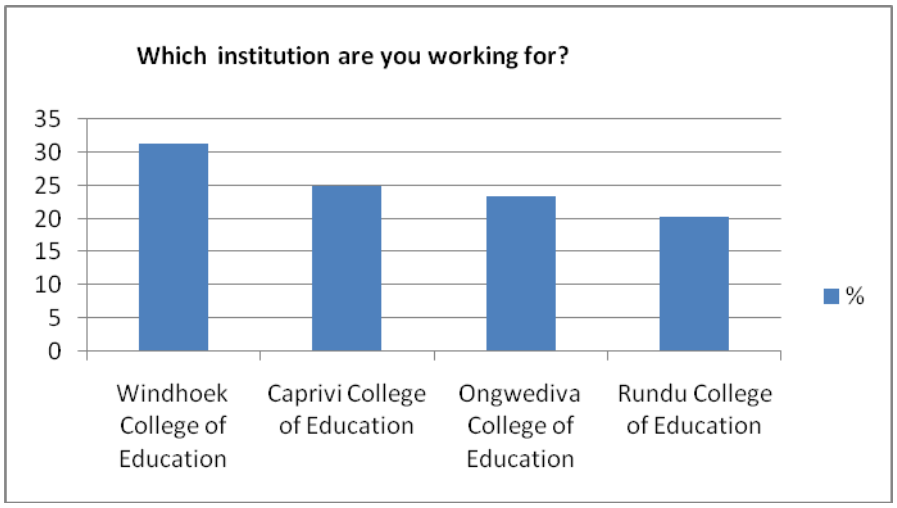


Figure 2 reveals two (2) aspects. Firstly, it is noted that the researcher distributed the questionnaire according to the total number of respondents or teacher educators that were in each college of education (see Chapter 4, section 4.7, page 89). The bigger the college the more questionnaires were distributed to it. However, the Windhoek and the Caprivi Colleges of Education, which are relatively the second biggest and smallest colleges of education in Namibia, show a high return and participation rate in the study. Secondly, the results confirm that the researcher visited all the Namibian Colleges of Education in order to increase the external and internal validity of data of the study (see Chapter 4, sections 4.8.1- 4.8.2).

The second (2nd) demographic question was about the departments in which the teacher educators work. The results of this question are indicated in figure 3.

Figure 3: The departments of the Namibian Colleges of Education

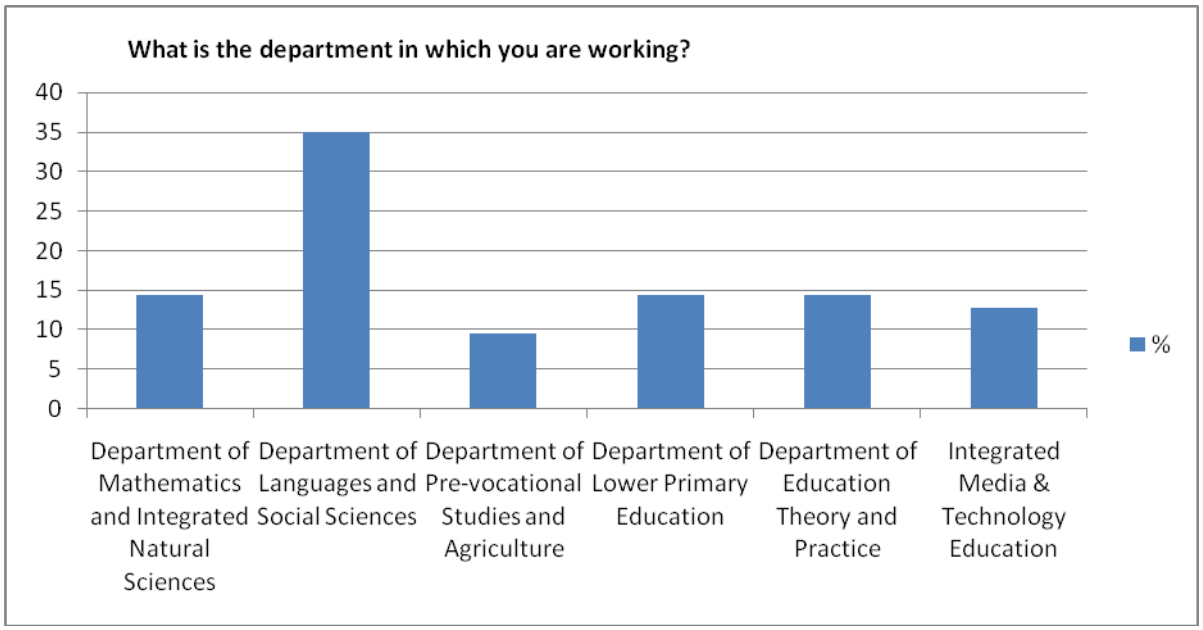


Figure 3 shows that the majority of those who participated in the study are from the Departments of Languages and Social Sciences. This department offers subjects such as Social studies, English, Oshikwanyama, Oshindonga, Rugxiriku, Timbukushu, Romanyo, Silozi and Afrikaans. The Departments of Mathematics and Integrated Natural Sciences, Lower Primary Education and Education Theory and Practice also participated in the study. In these departments subjects that are taught include Mathematics, Natural Sciences, Environmental studies and Educational theory. The Department of Integrated Media and Technology Education and Prevocational Studies and Agriculture also participated in the study. The subjects such as Interactive Technology, Woodwork, Art and Agriculture are included in these departments respectively.

The result means all departments in the Namibian Colleges of Education were reached.

The third (3rd) demographic question was about the subjects that are taught by teacher educators in various departments of the colleges of education. The results of the study are reported in table 7.

Table 7: Subjects taught by teacher educators

Subject	Teacher educators	%
Social Science Education	6	7.1
Arts and Culture Education	3	3.6
English	14	16.7
Education Theory and Practice	15	17.9
Other Languages	5	6.0
Mathematics	3	3.6
Integrated Natural science	9	10.7
Lower Primary Education	8	9.5
Agricultural Science	3	3.6
Integrated Media and Technology	13	15.5
Accounting	1	1.2
Needlework	1	1.2
Geography	1	1.2
History	2	2.4
Total	84	100

Table 7 shows that the majority of teacher educators who participated in the study teach subjects such as English, Education Theory and Practice and Integrated Media and Technology Education. This was followed by teacher educators who teach all the subjects in Lower Primary Education, Integrated Natural Sciences, Social Science Education and other languages. Other languages in this context refer to local Namibian languages such as Oshikwanyama, Oshindonga, Rugxiriku, Timbukushu, Romanyo, Silozi and Afrikaans. A small percentage of teacher educators who teach subjects such as Arts and Culture Education, Agricultural Sciences, History and Geography, Accounting, Needlework and Geography were also reached.

The above results represent a total of eighty four (84) teacher educarors in the Namibian Colleges of Education. This result shows that some teacher educators who participated in the study taught more than one (1) subject.

5.3 THE INCORPORATION OF ENVIRONMENTAL EDUCATION (EE) CURRICULUM GOALS IN THE NAMIBIAN COLLEGES OF EDUCATION

Part two (2) of the questionnaire was to establish the extent to which the EE curriculum goals are incorporated in the Namibian Colleges of Education. The results of this part are indicated in tables 8 -11. These tables display a brief description of each goal, the total number of teacher educators who said that they consider each sub goal as part of their teaching and the percentage of the total in each category. Teacher educators used the following scale when answering questions about each goal:

Slightly	Not at all	Fairly well
1	2	3

5.3.1 Goal 1: Ecological Foundation

There are seven (7) subgoals that were presented as shown in table 8 (see also Chapter 2, section 2.5.1).

Table 8: Ecological foundation subgoals currently addressed

Goal descriptions	Slightly	Not at all	Fairly well	Total
1. Individual and populations	(23) 37.1%	(19) 30.6%	(20) 32.3%	(62) 100%
2. Interactions and Interdependence	(17) 28.3%	(28) 46.7%	(15) 25.0%	(60) 100%
3. Ecosystems: structure, interaction and effects between living and non-living organisms	(19) 31.1%	(27) 44.3%	(15) 24.6%	(61) 100%
4. Succession	(12) 19.7%	(41) 67.2%	(8) 13.1%	(61) 100%
5. Energy and chemical cycles	(14) 23.0%	(36) 59.0 %	(11) 18.0 %	(61) 100%
6. Man as a component of the natural systems	(19) 31.7 %	(17) 28.3%	(24) 40.0%	(60) 100%
7. Homeostasis	(17) 28.5%	(35) 58.3 %	(8) 13.3 %	(60) 100%

It is highlighted that many teacher educators had fairly well incorporated ecological subgoals numbered one (1), two (2), three (3) and six (6) in table 8. This shows that four (4) out of seven (7) subgoals in this category are a significant part of teaching of one quarter ($^1/_4$) to more than one third ($^1/_3$) of the teacher educators. This means that some teacher educators in the Namibian Colleges of Education find ecological foundation subgoals to be relevant.

5.3.2 Goal 2: Conceptual Awareness: Issues and Values

Seven (7) subgoals that were explored are indicated in table 9 (see also Chapter 2, section 2.5.2).

Table 9: Conceptual awareness: issues and values subgoals currently addressed

Goal descriptions	Slightly	Not at all	Fairly well	Total
1 Sustainability and sustainable development	(19) 30.6%	(22) 35.5%	(21) 33.9%	(62) 100%
2. Identification of the differences between an environmental problem, an environmental issue and an environmental crisis	(28) 45.2	(27) 43.5	(7) 11.3%	(62) 100
3. Communicates how people's cultural activities such as politics, religion and social activities affect the environment	(24) 38.1%	(16) 25.4%	(23) 36.5 %	(63) 100%
4. Communicates how individual people and people in groups affect the environment	(25) 40.3%	(14) 22.6%	(23) 37.1%	(62) 100%
5. Students identify and clarify their values and attitudes toward an issue or the environment	(24) 38.1%	(16) 25.4%	(23) 36.5%	(63) 100%
6. Communicates that there may be more than one way to resolve an environmental issue or crisis	(24) 38.7%	(22) 35.5%	(16) 25.8%	(62) 100%
7. Communicates that the difficulty in solving environmental issues and crises is created by different attitudes and values that people involved in them have	(27) 44.3%	(17) 27.9%	(17) 27.9%	(61) 100%

It is highlighted that many teacher educators had fairly well incorporated conceptual awareness subgoals numbered one (1), three (3), four (4), five (5), six (6) and seven (7) in table 9. This shows that exactly six (6) out of seven (7) subgoals in this category are a significant part of teaching of more than one quarter ($^1/_4$) to more than one third ($^1/_3$) of the teacher educators who participated in the study. This shows that some teacher educators in the Namibian Colleges of Education find conceptual awareness: issues and values subgoals to be very relevant.

5.3.3 Goal 3: Investigation and Evaluation

The six (6) subgoals that were explored are shown in table 10 (see also Chapter 2, section 2.5.3).

Table 10: Investigation and evaluation subgoals currently addressed

Goal descriptions	Slightly	Not at all	Fairly well	Total
1. Problem solving skills to identify specific environmental problems, issues and crises	(20) 31.7%	(31) 49.2%	(12) 19.0%	(63) 100%
2. Identification of actors and stakeholders involved in an environmental issue and crisis	(21) 33.3%	(34) 54.0%	(8) 12.7%	63 100
3. Identification of beliefs and values that explain people's position on environmental problems, issues and crises	(22) 34.9%	(30) 47.6%	(11) 17.5%	(63) 100%
4. Identification of the ecological costs and benefits of designated solutions to the environmental problems, issues and crises	(18) 28.6%	(37) 58.7%	(8) 12.7%	(63) 100%
5. Examination of a variety of environmental issues and crises	(19) 30.0%	(29) 46.0%	(15) 23.8%	(63) 100%
6. Identification of the human costs and benefits of designated environmental problems, issues and crises	(20) 31.7%	(35) 55.6%	(8) 12.7%	(63) 100%

It is highlighted that many teacher educators who participated in the study had not at all incorporated investigation and evaluation subgoals numbered one (1), two (2), three (3), four (4) and six (6) in table 10. This should be noted because it shows that exactly five (5) out of six (6) subgoals in this category are not a significant part of teaching of more than half ($^1/_2$) of the teacher educators who participated in the study. The results mean that teacher educators in the Namibian Colleges of Education do not find investigation and evaluation subgoals to be relevant.

5.3.4 Goal 4: Environmental action skills, training and application

The six (6) subgoals that were explored are shown in table 11 (see also Chapter 2, section 2.5.4).

Table 11: Environmental action skills, training and application subgoals currently addressed

Goal descriptions	Slightly	Not at all	Fairly well	Total
1. Communicating the need for responsible citizenship action to resolve environmental problems, issues and crises	(22) 35.4%	(21) 33.9%	(19) 30.6%	(62) 100%
2. Communicating the various levels of environmental action	(16) 25.8%	(36) 58.1%	(10) 16.1%	(62) 100%
3. Identification of environmental action categories.	(12) 19.7%	(41) 67.2%	(8) 13.1%	(61) 100%
4. Examination of scenarios and case studies	(23) 37.1%	(34) 54.8%	(5) 8.1%	(62) 100%
5. Identification of the human and ecological costs and benefits of identified environmental action	(20) 32.2%	(36) 58.1%	(6) 9.7%	(62) 100%
6. Individuals or a group of students take action on an environmental problem that they have identified and analyzed	(19) 30.6%	(37) 59.7%	(6) 9.7%	(62) 100%

It is highlighted that many teacher educators who participated in the study had not at all incorporated environmental action skills, training and application sub goals shown in table 11. This should be noted because it is shown that exactly all six (6) subgoals in this category are not a significant part of teaching of one third ($^1/_3$) to two thirds ($^2/_3$) of the teacher educators who participated in the study. The results show that teacher educators in the Namibian Colleges of Education do not find any of the environmental action skills, training and application subgoals to be relevant.

5.4 TEACHER EDUCATORS' UNDERSTANDING, AWARENESS AND INTERPRETATION OF CROSS-CURRICULAR TEACHING AS A MODEL FOR INCORPORATING ENVIRONMENTAL EDUCATION (EE) FOR SUSTAINABILITY IN THE NAMIBIAN COLLEGES OF EDUCATION

Part three (3) of the questionnaire was about the teacher educators' understanding, awareness and interpretation of the concept cross-curricular teaching as a model for incorporating Environmental Education (EE) in the Namibian Colleges of Education. This part consists of three (3) questions that are presented below.

The first (1st) question enquired if teacher educators were informed of the need to incorporate (teach) Environmental Education (EE) as a cross-curricular theme. The results are shown in figure 4.

Figure 4: Awareness of the need to incorporate (teach) EE for sustainability

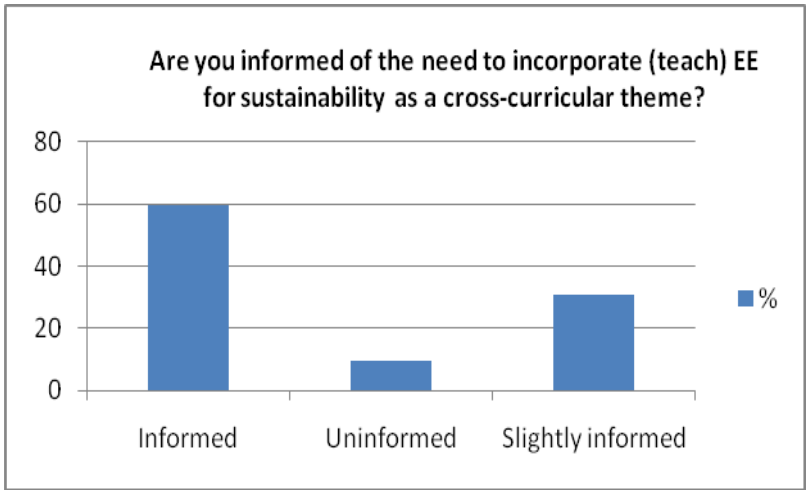


Figure 4 shows that a good percentage of teacher educators fall in the category of those who are 'informed' about the incorporation of EE as a cross curricular theme. Given that EE is not a cross curricular approach to teaching in the Namibian Colleges of Education, the results imply that many teacher educators are only informed about the cross curricular incorporation of EE but that they do not actually use the approach in relation to EE.

The frequencies presented in figure 4 above were cross-tabulated with frequencies obtained about the departments of the Namibian Colleges of Education (see also figure 3 on page 106). The cross tabulation of frequencies help the researcher to compare how the level of EE awareness is spread in departments of the Namibian Colleges of Education. It also helps to ascertain whether the departments of teacher educators influence the awareness about the incorporation of EE. The cross tabulation of frequencies are shown in table 12.

Table 12: Awareness of the need to incorporate Environmental Education (EE) as a cross curricular theme by department

Departments	Informed	Uninformed	Slightly informed	Total
Department of Mathematics and Integrated Natural Sciences	(4) 44.4%	(2) 22.2%	(3) 33.3%	(9) 100%
Department of Languages and Social Sciences	(14) 66.7%	(1) 4.8%	(6) 28.6%	(21) 100%
Department Pre-vocational Studies and Agriculture	(4) 66.7%	(0) 0%	(2) 33.3%	(6) 100%
Department of Lower Primary Education	(5) 55.5%	(1) 11.1%	(3) 33.3%	(9) 100%
Department of Education Theory and Practice	(6) 75.0%	(0) 0%	(2) 25.0%	(8) 100
Integrated media & Technology Education	(4) 50.0%	(2) 25.0%	(2) 25.0%	(8) 100%
Total	37	6	18	61

Note: X^2 = 32.45; dif =2; p<0.00; missing values = 3

With the chi-square (X^2) value of (2; N = 61= 32.45) = p< 0.00, table 12 shows that there is a significant difference with regard to the level of awareness about the incorporation of EE. The extent to which teacher educators are 'informed', 'uninformed' or 'slightly informed' is determined to a certain extent by the department in which the teacher educators work. The department of Languages and Social Sciences, Pre vocational Studies and Agriculture as well as Education Theory and Practice seems to relatively fall in the category of 'informed'.

It is noted that a larger number (37 out of 61) of the teacher educators accross the departments of the Namibian Colleges of Education fall in the category of those who are 'informed' about the incorporation of EE. The percentages of teacher educators who were 'informed' about the incorporation of EE exceeded those that were 'uninformed' and 'slighttly informed'. Two thirds ($^2/_3$) or more teacher educators in the departments of Languages and Social Sciences, Prevocational Studies and Agriculture and Education Theory and Practice were 'informed' about the incorporation of EE. The departments of Mathematics and Integrated Natural Sciences as well as Integrated Media and Technology Education should also be noted because there are nearly one half ($^1/_2$) of the teacher educators who fall in the category of 'informed'.

The second (2nd) question addressed the sources of information about the incorporation of Environmental Education (EE). The results to this question are shown in figure 5.

Figure 5. Sources of information about the incorporation of EE as a cross-curricular theme

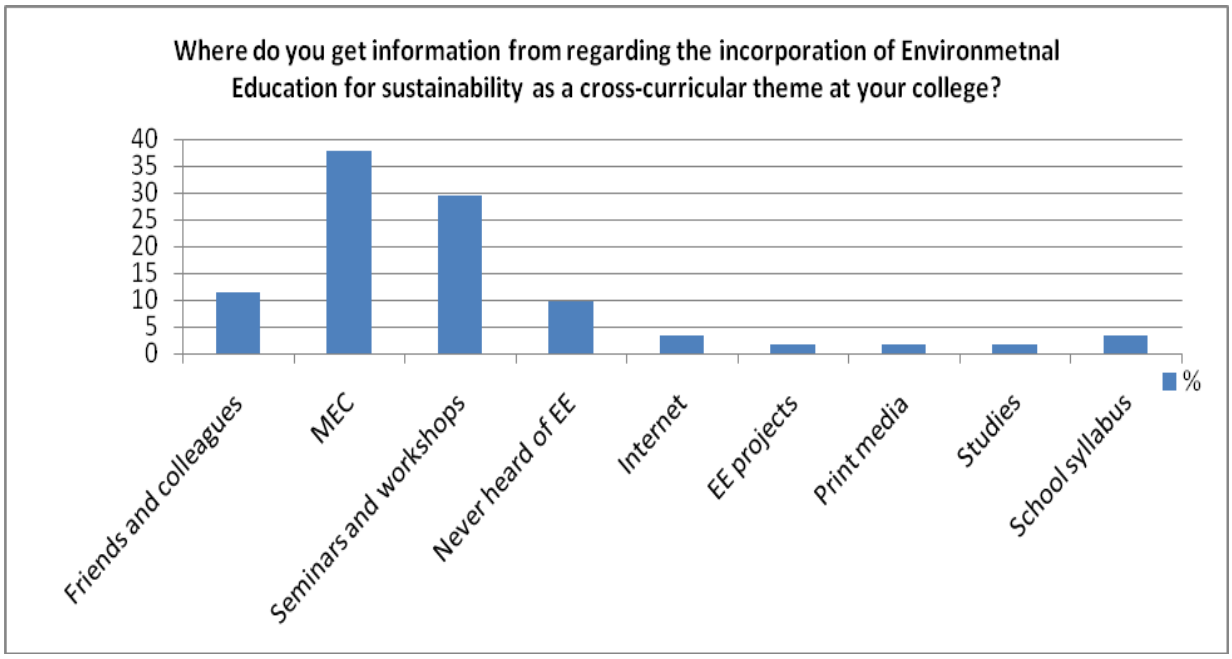


Figure 5 shows that the Ministry of Education and Culture (MEC) is the major source of information about the incorporation of EE because the majority of teacher educators chose that source. This is followed by seminars and workshops, friends and colleagues. Other teacher educators had no sources because they never heard of EE as a cross curricular theme. The other sources of information about the incorporation of EE include the Internet, EE projects, print media, studies and school syllabus.These sources of information are insignificant because they accounted for less than one quarter ($^1/_4$) of the respondents.

The frequencies presented in figure 5 above were cross-tabulated with the frequencies about the departments of the Namibian Colleges of Education (see also figure 3 on page 106). The cross-tabulation of frequencies helps the researcher to

compare the sources of information of the teacher educators regarding the incorporation of Environmental Education (EE). It also ascertains whether departments of teacher educators determine the category of sources from which they get information regarding the incorporation of EE in the Namibian Colleges of Education. The cross tabulation of frequencies are shown in table 13.

Table 13: Sources of information about the incorporation of EE by department

Department	Friends and Colleagues	Ministry of Education and Culture (MEC)	Seminars and Workshops	Never heard of EE	Internet	EE Projects	Print media	Studies	School Syllabus	Total
Department of Mathematics and Integrated Natural Sciences	(1) 14.3%	(2) 8.7%	(4) 23.5%	(2) 33.3%	(0) %	(0) %	(0) 0%	(0) 0%	(0) 0%	(9) 15.%
Department of Languages and Social Sciences	(2) 28.6%	(10) 43.5%	(7) 41.2%	(0) 0%	(0) 0%	(0) 0%	(0) 0%	(0) 0%	(2) 100%	(21) 35%
Department of Pre-vocational Studies and Agriculture	(0) 0%	(1) 4.3%	(4) 23.5%	(0) 0%	(0) 0%	(0) 0%	(1) 100%	(0) 0%	(0) 0%	(6) 10.%
Department of Lower Primary Education	(1) 14.3%	(5) 21.7%	(1) 5.9%	(1) 16.7%	(1) 50.0%	(0) 0%	(0) 0%	(0) 0%	(0) 0%	(9) 15%
Department of Education Theory and Practice	(2) 28.6%	(2) 8.7%	(1) 5.9%	(0) 0%	(1) 50.0	(1) 100.00	(0) 0%	(1) 100%	(0) 0%	(8) 13.%
Integrated media & Technology Education	(1) 14.3%	(3) 13.0%	(0)	(3) 50.0	(0) 0%	(0) 0%	(0) 0%	(0) 0%	(0) 0%	(7) 11.%
Total	(7) 100%	(23) 100%	(17) 100%	(6) 100%	(2) 100%	(1) 100%	(1) 100%	(1) 100%	(2) 100%	(60) 100%

Note: X^2 = 79.02; dif=8; p <0.00; missing values = 4

With the chi-square (X^2) value of (8; N = 60) = 79.02; $p < 0.00$, table 13 shows there is a significant difference with regard to the sources of information of the teacher educators regarding the incorporation of Environmental Education (EE). Significantly, the sources from which teacher educators get information are determined by the department in which they are placed. It seems that the majority of teacher educators in the departments of Languages and Social Sciences as well as Lower Primary Education mainly got information from the Ministry of Education and Culture (MEC).

It is noted the Minsitry of Education and Culture covers all departments of the Namibian Colleges of Education. Seminars and workshops as well as friends and colleagues seem to be significant source of information in the sense that five (5) out of six (6) departments got information from these sources. The result means some teacher educators have heard about the incorporation of EE but had not attended workshops and seminars about this matter. The others are not significant sources of information because they do not cover all the departments. These are Internet, EE projects, print and electronic media, studies and the school syllabus. It is noted that the teacher educators in the Departments of Mathematics and Integrated Natural Sciences and Integrated Media and Technology Education never heard about the incorporation of EE as a cross curricular theme.

The third (3rd) question enquired about the identification of a definition of cross-curricular teaching that characterizes teacher educator's own understanding of the concept. The results to this question are shown in table 14.

Table 14: Teacher educators' understanding of cross-curricular teaching

Definition	Teacher educators	%
a) Cross-curricular teaching is a process whereby teachers of science and Environmental Education develop and implement a programme in their department that coordinates with the other programmes throughout the school.	15	24.6
b) Cross-curricular teaching is a process by which a group of educators collaborate to identify, teach and assess an Environmental Education concept through the eyes of their subjects.	35	57.4
c) Cross-curricular teaching is process by which students are made to explore what they are learning, write about what they are learning and interact with their classmates in various grades	10	16.4
d) None of the above	1	1.6
Total	61	100

Table 14 shows that the majority of teacher educators chose definition B. This definition is consistent with the perception of Environmental Education (EE) held in this study. These results show that more than one half ($^1/_2$) of the teacher educators holds a good grasp of the concept of cross-curricular teaching. Although cross-curricular teaching is not a common approach to teaching in the Namibian Colleges of Education, the result implies that the majority of teacher educators have an idea about what it entails.

The frequencies in table 14 above were cross-tabulated with the frequencies obtained about the departments of the Namibian Colleges of Education (see also figure 3 on page 106). The cross tabulation of frequencies helps the researcher to compare the teacher educators' understanding regarding the concept cross-curricular teaching. It also ascertains whether departments of the teacher educators influence how they understand the concept of cross curricular teaching. The cross tabulation of frequencies are shown in table 15.

Table 15: Teacher educators' choices of definitions of cross-curricular teaching by department

Definitions	Department of Mathematics and Integrated Natural Sciences	Department of Language and Social Sciences	Department of Pre-vocational Studies and Agriculture	Department of Lower Primary Education	Department of Education Theory and Practice	Integrated Media & Technology Education	Total
a) Cross-curricular teaching is a process whereby teachers of science and Environmental Education develop and implement a programme in their department that coordinates with the other programmes throughout the school	(3) 21.1	(4) 28.6%	(0) 0%	(4) 28.6	(2) 14.3%	(1) 7.1%	(14) 100%
b) Cross-curricular teaching is a process by which a group of educators collaborate to identify, teach and assess an Environmental Education concept through the eyes of their subjects.	(4) 11.4	(13) 37.1	(6) 17.1	(3) 8.6	(4) 11.4	(5) 14.3	(35) 100%
c) Cross-curricular teaching is process by which students are made to explore what they are learning, write about what they are learning and interact with their classmates in various grades	(1) 10%	(3) 30.0%	(0) 0%	(2) 20.0%	(2) 20.0%	(2) 20.0%	(10) 100%
Total	(8) 13.1%	(20) 35.0%	(6) 10.0	(9) 15.0	(8) 13.3%	(8) 13.3%	(59) 100

Note: X^2 =40.70; dif=3; p <0.00: Missing values: 5

The chi-square (X^2) value of (3; N = 60) = 40.70, p < 0.00, table 15 shows that there is a significant difference with regard to the teacher educators' choices of definitions of cross-curricular teaching. Significantly, the results show that the departments determine teacher educators' own understanding and choice of definition of cross-curricular teaching. The results seem to suggest that the majority of teacher educators in the Department of Languages and Socail Sciences, Pre-vocational Studies and Agriculture and Intergrated Media and Technolgy Education relatively fall in Category B.

It is noted that a larger number (35 out of 60) of the teacher educators accross the departments of the Namibian Colleges of Education fall in the category of definition B. In the Departments of Language and Integrated Social Sciences and Prevocational Studies and Agriculture, the percentages of teacher educators who chose definition B exceeded those who chose other definitions.

The fourth (4th) question was about the importance of incorporating Environmental Education (EE) as a cross-curricular theme in the Namibian Colleges of Education. The results to this question are shown in figure 6.

Figure 6: The importance of incorporating EE as a cross-curricular theme

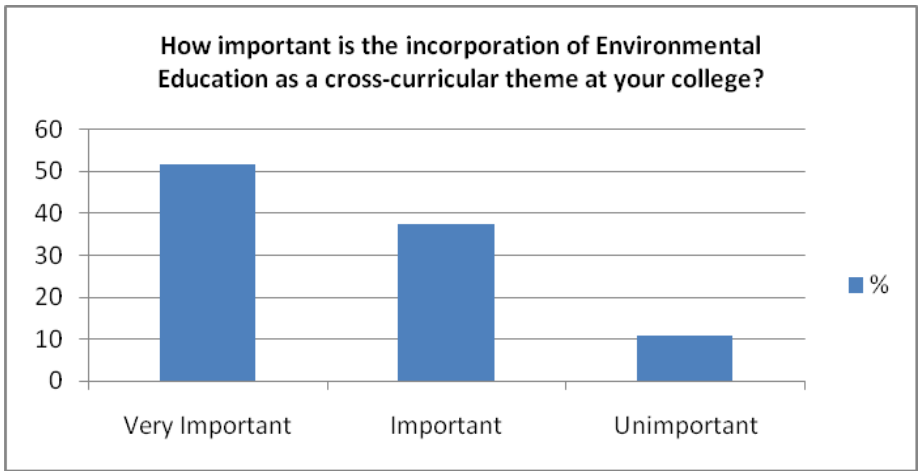


Figure 6 shows that more than half (½) of the teachers educators fall in the category that regards the incorporation of EE as 'important'. This should be noted because it shows that even without the common use of this approach, the teacher educators find it 'important'.

The frequencies presented in figure 6 above were cross-tabulated with frequencies obtained about the departments of the Namibian Colleges of Education (see also figure 3 on page 106). The cross tabulation of frequencies enables the researcher to compare and ascertain whether departments of teacher educators determine the importance that teacher educators attach to EE. The cross tabulation of frequencies are shown in table 16.

Table 16: The importance of incorporating Environmental Education (EE) by department

Departments		Very important	Important	Unimportant	Total
Department of Mathematics and Integrated Natural Sciences	Count	(5)	(3)	(1)	(9)
	%	55.6	33.3	11.1	100.0
Department of Languages and Social Sciences	Count	(17)	(4)	(1)	(22)
	%	77.3	18.2	4.5	100.0
Department of Pre-vocational Studies and Agriculture	Count	(3)	(3)	(0)	(6)
	%	50.0	50.0	0	100.0
Department of Lower Primary Education	Count	(4)	(2)	(3)	(9)
	%	44.4	22.2	33.3	100.0
Department of Education Theory and Practice	Count	(3)	(6)	(0)	(9)
	%	33.3	66.7	0	100.0
Integrated media & Technology Education	Count	(0)	(6)	(2)	(8)
	%	0%	75.0	25.0	100.0
Total	Count	(32)	(24)	(7)	(63)
	%	50.8	38.1	11.1	100.0

Note: X^2 =16.34; dif =2; p <0.00: Missing values: 1

The chi-square (X^2) value of (2; N = 63) = 16.34; p< 0.00, table 16 shows that there is a significant difference with regard to teacher educators' perception of the importance of EE in the Namibian Colleges of Education. Significantly, these results show that the departments of teacher educators influence how important EE is to them. The results seem to suggest that the majority of teacher educators in the Departments of Languages and Social Sciences, Mathematics and Integrated Natural Sciences, Prevocational Studies and Agriculture as well as Lower Primary Education relatively fall in a category that perceives EE as 'very important'.

It is highlighted that a larger number of (32 out of 63) teacher educators fall in the category that perceives EE as 'very important'. The results show that the teacher educators across the departments of the Namibian Colleges of Education view EE in a positive light.

5.5 REASONS FOR NOT INCORPORATING ENVIRONMENTAL EDUCATION (EE) AS A CROSS-CURRICULAR THEME IN THE NAMIBIAN COLLEGES OF EDUCATION

Part four (4) of the questionnaire was about reasons for not incorporating EE and conditions that would enhance the cross-curricular incorporation of EE in the Namibian Colleges of Education. This part consists of two (2) questions that are now being discussed.

The first (1st) question was asked to find out why teacher educators fail to incorporate (teach) EE as a cross-curricular theme in the subjects of the Namibian Colleges of Education and what the reasons for not doing so are. The results of this question are shown in table 17.

Table 17: Teacher educators' reasons for not incorporating EE

Reasons for not incorporating EE	Teacher educators	%
A. E E as a cross -curricular theme is not on the college timetable	20	46.9
B. I do not have knowledge to teach EE as a cross-curricular theme	4	8.2
C. What I teach is not relevant to EE	7	14.3
D. I am not interested in teaching EE as a cross-curricular theme	1	2.0
E. Only a few educators teach EE	1	2.0
F. EE is already incorporated in the Second Language Education (SLE) syllabus	2	4.1
G. We teach it in science subjects only	1	2.0
H. Lack of resources	1	2.0
I. Incorporating EE is time consuming and the curriculum is overloaded	1	2.0
J. EE is not incorporated in my subject syllabus	5	10.2
K. No clear guidelines for EE teaching	1	2.0
L. Lack of interdepartmental collaboration	1	2.0
M. No specific reason	1	2.0
Total	46	100.0

Table 17 shows that many teacher educators (46.9%) chose reason A. These teacher educators imply that placing Environmental Education (EE) on the time table may facilitate its incorporation. Some teacher educators (8.2%) chose reason B while others (14.3%) suggested reason C. The results seem to imply that some teacher educators do not have an idea about how to incoprorate it in their subjects and departments. Some of them do not seemingly believe that EE components could be identified in their subjects.

There are other reasons that were chosen by teacher educators but the percentages are not significant. These are entered in table 17 as reasons D – L. Some teacher educators chose no specific reason. However, these reasons seem to predominantly suggest a lack of support and training as reason for not incorporating EE in the Namibian Colleges of Education.

The frequencies presented in table 17 were cross-tabulated with the frequencies obtained about the departments of the Namibian Colleges of Education (see also figure 3 on page 106). The cross tabulation of frequencies enables the researcher to compare and ascertain whether the departments of teacher educators determine the choice of reasons for incorporating EE in the Namibian Colleges of Education. The cross tabulation of frequencies are shown in table 18.

Table 18: Teacher educators' reasons for not incorporating Environmental Education (EE) by department

Reasons for not incorporating EE	Department of Mathematics and Integrated Natural Sciences	Department of Languages and Social Sciences	Department of Pre-vocational Studies and Agriculture	Department of Lower Primary Education	Department of Education Theory and Practice	Department of Integrated media & Technology Education	Total
A. EE as a cross - curricular theme is not on the college timetable	(3) 27.7%	(8) 36.4%	(2) 9.1%	(3) 13.6%	(2) 9.1	(2) 9.1	(20) 100%
B. I do not have knowledge to teach EE as a cross-curricular theme	1 25.0%	1 25.0%	1 25.0%	(0) 0%	1 25.0%	(0 0%)	(4) 100%
B. What I teach is not relevant to EE	(1) 14.3	(0) 0%	(0) 0%	(1) 14.3%	(3) 43.9%	(2) 28..6%	(7) 100%
C. I am not interested in teaching EE as a cross-curricular theme	(0) 0%	(0) 0%	(0) 0%	(0) 0%	(0) 0%	(1) 100%	(1) 100%
D. Only a few educators teach EE	(0) 0%	(1) 100%	(0) 0%	(0) 0%	(0) 0%	(0) 0%	(1) 100%
E. EE is already incorporated in the Second Language Education (SLE) syllabus	(0) 0%	(2) 100%	(0) 0%	(0) 0%	(0) 0%	(0) 0%	(2) 100%
F. We teach it in science subjects only	(1) 100%	(0) 0%	(0) 0%	(0) 0%	(0) 0%	(0) 0%	(1) 100%
G. Lack of resources	(0) 0%	(1) 100%	(0) 0%	(0) 0%	(0) 0%	(0) 0%	(1) 100%
H. Incorporating EE is time consuming and the curriculum is overloaded	(0) 0%	(0) 0%	(0) 0%	(0) 0%	(1) 100%	(0) 0%	(1) 100%
I. EE is not incorporated in my subject syllabus	(0) 0%	(2) 57.1%	(0) 0%	(2) 28.5%	(1) 14.4%	(0) 0%	(5) 100%
K. No clear guidelines for EE teaching	(0) 0%	(0) 0%	(0) 0%	(0) 0%	(1) 100%	(0) 0%	(1) 100%
L. Lack of interdepartmental collaboration	(0) 0%	(0) 0%	(1) 100%	(0) 0%	(0) 0%	(0) 0%	(1) 100%
N. No specific reason	(0) 0%	(1) 100%	(0) 0%	(0) 0%	(0) 0%	(0) 0%	(1) 100%
Total	(6) 16.7%	(16) 33.3%	(4) 8.3%	(6) 12.5%	(9) 18.8%	(5) 10.4%	(46) 100%

Note: X^2=139.27; dif=14; p<0.00; missing values: 16

The chi-square (X^2) value of (14; N = 48) = 139.27; p < 0.00, table 18 shows that there is a significant difference with regard to teacher educators' reasons for not incorporating EE in the Namibian Colleges of Education. Significantly, these results

show that the departments of the teacher educators determine reasons for not incorporating Environemntal Education (EE) in the Namibian Colleges of Education. It is demonstrated in table 18 that a significant percentage of teacher educators in the Departments of Lower Primary Education and Integrated Media and Technology Education relatively chose reason A. The latter department also seems to relatively fall in the category of reason C.

It is significant that a larger number (22 out 48) of the teacher educators, perceive lack of EE cross-curricular themes on the time table as one of the main reasons for not incorporating EE in their subjects. All the departments of the Namibian Colleges of Education chose this reason. The other reason that seems significantly commom among the Departments of the Namibian Colleges of Education is the lack of knowledge about how to incorporate EE as a cross- curricular theme.

The second (2^{nd}) question that was asked is about conditions that would enhance the incorporation (teaching) of EE at the college. The results to this question are shown in Table 19.

Table 19: Conditions that would enhance the incorporation of Environmental Education (EE)

Conditions that would enhance the incorporation of EE in the Namibian Colleges of Education	Teacher educators	%
A. Provision of In-service training about how to incorporate EE	25	40.3
B. Provision of more support from the Ministry of Education	7	11.3
C. Create space for EE on the timetable	9	16.1
D. Better access to resources	14	22.6
E. Emphasise EE in the curriculum/ syllabus	2	3.2
F. Colleges should be required to provide proof of cross-curricular themes	1	1.6
G. Availability of material and resources in the Namibian Languages regarding EE	1	1.6
H. This is not possible at the college level	1	1.6
I. It should be integrated into curriculum of science subjects	1	1.6
Total	61	100.0

It is highlighted in table 19 that most teacher educators (40.3%) chose condition A while some of them (11.3%) chose condition B. Sixteen point one percent (16.1%) of the teacher educators chose condition C while 22.6% of them chose condition D. The other conditions that were cited are marked E – I in table 19. The results seem to show that the majority of teacher educators need in-service training about how to incorporate EE in the Namibian Colleges of Education.

The frequencies presented in table 19 above were cross-tabulated with frequencies obtained about the departments of the Namibian College of Education (see also figure 3 on page 106). The cross tabulation of frequencies enables the researcher to compare the conditions for incorporating EE that are favoured by the teacher educators in the various departments. It also helps the researcher to ascertain whether the departments of the teacher educators determine the choice of a condition that would facilitate its incorporation in the Namibian Colleges of Education. The cross tabulation of frequencies are shown in table 20.

Table 20: Conditions that would enhance the incorporation of Environmental Education (EE) by department

Conditions	Department of Mathematics and Integrated Natural Sciences	Department of Languages and Social Sciences	Department of Pre-vocational Studies and Agriculture	Department of Lower Primary Education	Department of Education Theory and Practice	Integrated media and Technology Education	Total
A. Provision of In-service training about how to incorporate EE as a cross-curricular	(4) 16.0%	(7) 28.0%	(4) 16.0%	(4) 16.0%	(3) 12.0%	(3) 12.0%	(25) 100%
B. Provision of more support from the Ministry of Education	(0) 0%	(5) 71.4%	(0) 0%	(0) 0%	(1) 14.3%	(1) 14.3%	(7) 100%
C. Create space for EE on the timetable	(3) 33.3%	(3) 33.3%	(0) 100%	(1) 11.1%	(1) 11.1%	(1) 11.1%	(9) 100%
D. Better access to resources	(2) 14.3%	(3) 21.4	(0) 0%	(3) 21.4	(4) 28.6%	(2) 14.3%	(14) 100%
E. Emphasize EE in the curriculum	(0) 0%	(1) 50%	(0)	(1) 50%	0) 0%	0) 0%	(2) 100%
G. Colleges should be required to provide proof of cross-curricular themes	(0) 0%	(0) 0%	(1) 100%	(0) 0%	(0) 0%	(0) 0%	(1) 100%
H. Availability of materials and resources in the Namibian Languages	(0) 0%	(1) 100%	(0) 0%	(0) 0%	(0) 0%	(0) 0%	(1) 100%
I. This is not possible at the college level	(0) 0%	(0) 0%	(1) 100%	(0) 0%	(0) 0%	(0) 0%	(1) 100%
J.It should be Integrated into the curriculum of science subjects	(0) 0%	(0) 0%	(1) 1O0%	(0) 0%	(0) 0%	(0) 0%	(1) 100
Total	(9) 14.7%	(20) 32.6%	(7) 11.7%	(9) 14.7%	(9) 14.7%	(7) 11.7%	(61) 100

Note: X^2=95.42; dif=9; p<0.00: missing values= 3

The chi-square (X^2) value of (9; N= 61) = 95.42; p < 0.00, table 20 shows that there is a significant difference with regard to the conditions favoured by the teacher educators to enhance the incorporation of EE in the Namibian Colleges of Education. It is highlighted that the majority of the teacher educators in the Department of

Languages and Social Sciences seems to relatively prefer conditions A, B, C and D in table 20.

It is noted that a larger number (25 out of 61) of teacher educators from departments seems to prefer condition A. The other conditions that seem common among the departments are marked C and D. These results highlight a lack of training in EE in the Namibian Colleges of Education.

5.6 TEACHER EDUCATORS' FINAL COMMENTS REGARDING THE INCORPORATION OF ENVIRONMENTAL EDUCATION (EE) FOR SUSTAINABILITY IN THE NAMIBIAN COLLEGES OF EDUCATION

Part five (5) of the questionnaire asked teacher educators to make final comments regarding the incorporation of EE in the Namibian Colleges of Education. This part consisted of one open ended question. The purpose of this question was to ask teacher educators to state any idea or information that they would like to share with the researcher and to indicate anything about EE that may not have been covered in the questionnaire. The question attracted a variety of divergent responses from the teacher educators in the Namibian Colleges of Education. The responses of the teacher educators' were grouped into seven (7) response groups in order to facilitate the analysis. These response groups are summarised in table 21 and discussed thereafter.

Table 21: Summarised teacher educators' final comments

Response grouping	Teacher educators	%
1. Teacher educators need training and materials about EE	14	34.1
2. EE should be incorporated in all subjects because it provides knowledge and education that could save the world	10	24.4
3. EE should be placed in the syllabus, calendar and time table	7	17.1
4. Namibia has done very little to promote EE in the schools	4	9.8
5. Incorporation of EE is possible in some grades and subject areas	3	7.3
6. Enough is being done to promote EE in the education system	2	4.9
7. Teacher educators should take learners to environmentally threatened areas	1	2.4
Total	41	100

The first (1st) response group (34.1%) believes that teacher educators need training and materials about the incorporation of Environmental Education (EE). The teacher educators in this response group also made important assertions to justify the need for training and materials among teacher educators in the Namibian Colleges of Education. These are:

- Firstly, they are aware that EE is one of the cross- curricular themes and that it is a good idea to incorporate it in all subjects of the Namibian Colleges of Education,

- Secondly, they emphasize that our education system cannot afford to treat EE with little significance at a stage when climate change and its impact on the environment are making headlines worldwide and is affecting our daily lives. There is a need for the incorporation of more EE topics into the Namibian education curriculum in order to create a better understanding and create environmental awareness because all human activities depend on the environment,

- Lastly, they also assert that the incorporation of Environmental Education (EE) is a policy issue and should not be compromised in education. These

teacher educators emphasize that EE is a crucial subject in the Namibian Education system but one of the hindrances that prevent its effective incorporation is lack of know-how to incorporate it in ways that facilitate greater understanding and meaning to all the teacher trainees

The assertions made above are seen by these teacher educators as challenges that threaten the incorporation of EE in the Namibian Colleges of Education. Various suggestions were therefore offered in order to overcome the challenges. These suggestions are:

- Teacher educators must be empowered with information that brings about change in attitudes and practices in the colleges of education and the wider community. Teacher educators should be provided with literature and resources that facilitate the cross-curricular incorporation of EE in all departments of the Namibian Colleges of Education. They should be trained in designing teaching aids and materials such as charts, flash cards and posters because lack of teaching aids and materials negatively influence the incorporation of EE in the departments of the Namibian Colleges of Education. Moreover, training in designing of teaching aids and materials enables teacher trainees to see the importance of using their own teaching aids and materials during lessons. It empowers them with the know-how for the design of a classroom environment that effectively uses their own teaching aids and materials as a whole. The knowledge of developing teaching aids and materials enables the teacher educators to implement student-centred teaching methods and to design a variety of teaching aids that are responsive to the learner's needs in a given context. The visual support provides sensory stimulation necessary for growth and enables learners to learn effectively because they can see, touch and smell what they are being taught. Training on design of teaching aids and material is important because it develops commitment and professional skills that could address challenges that threaten the incorporation of EE in the Namibian Colleges of Education in particular and the Namibian education system in general.

- Curriculum experts must review the current curricula and examine how best Environmental Education (EE) can be incorporated. This should be followed by a sustained program of workshops and seminars that is meant to empower teacher educators on how they can teach and assess EE across the curriculum in the Namibian Colleges of Education. Incorporation of EE in the Namibian Colleges of Education can only be realized if sensitization and information sharing and workshops are conducted in all colleges. If EE should become a compulsory cross-curricular theme in relevant subjects there should be more emphasis on links between educational planners and all stakeholders in order to sensitize all role players about the importance of EE as a cross-curricular theme in the Namibian Colleges of Education.

- The Ministry of Education and Culture must coordinate and share efforts from all institutions regarding the incorporation of EE in the Namibian education system in general. This is important because it will ensure that teacher educators are constantly reminded of the incorporation of EE in their subjects. From the above discussion, it can be deduced that there is a significant number of teacher educators who are passionate about the incorporation of EE in the Namibian education system.

The second (2^{nd}) response group (24.4%) believes that EE should be incorporated in the Namibian Colleges of Education because it provides knowledge that could save the world from destruction and degradation. A variety of assertions were made to support this notion. These are now presented.

- EE unfolds the causes of unnecessary creation of Carbon Dioxide ($CO_{2)}$ which contributes to global warming. It ensures that the causes of CO_2 emissions are understood and disseminated to beneficiaries who will be empowered with knowledge to stop the unnecessary production of CO_2. The consequences of using chemicals which depletes the ozone layer is understood by student teachers who will transmit such knowledge to the learners and through this knowledge teacher educators and learners would avoid buying products that contain dangerous chemicals.

- It enables teacher educators to empower teacher trainees with knowledge to care and sustain the environment around them. It is very important that they conserve the natural resources so that the future generations will be able to use the same resources. They will know which plants to plant where, when and why. They will care for our own water well and would continue to enjoy fresh fish which is good for our health.

- It provides knowledge of the environment in which people live and enhances productivity, innovation, and creativity**.** Activities that help students to relate what they learn in the classroom to the environment around them could be developed. Sustainability of the resources will be extended to each and every student or citizen of Namibia.

- Teacher trainees are human beings who would be working and interacting with other human beings who may lack knowledge necessary for sustainable use of resources. The knowledge gained is crucial because it would enable them to link and understand the interdependence of living organisms in the natural environment.

- It helps to develop language skills of reading, speaking, writing, and listening. The process of incorporating Environmental Education (EE) in language teaching enables teacher educators to give student teachers real environmental issues that affect them both at college and in their communities and to analyze and discuss them in the classroom.

- The next reason is that the colleges of education train the teachers who will teach EE in the basic education curriculum (primary and secondary). Once they understand the importance of EE, then they will pass the knowledge on to the younger generations. They assert that to incorporate EE is important because the benefits of such incorporation may benefit not only learners but also the community. They suggest that an EE curriculum should be integrated in all types of subjects of the Namibian Colleges of Education. The Ministry of Education and Culture must support and coordinate the idea for the immediate incorporation of Environmental Education (EE) in the schools and

colleges. All people should be educated about the importance of incorporating EE in the education curriculum

- The last reason is that it spreads scientific knowledge to the teacher educators and student teachers who are not specialised in such matters. The teacher educators would learn more and have knowledge about EE. In this way EE would enable all teacher educators and learners to ultimately achieve a desirable quality of life for themselves, family and community and future generations**.**

A recommendation that calls on the Ministry of Education (MEC) to ensure that all teacher educators have a Namibian Environmental Education Certificate (NEEC) that is offered by the Polytechnic of Namibia (PoN) so that thorough and successful incorporation of EE in the Namibian Colleges of Education is ensured was also made by the teacher educators in this response group. It can be deduced that there are educators in the Namibian Colleges of Education who are conscious about the ecological and social importance of incorporating EE in the Namibian Colleges of Education.

The third (3rd) response group (17.1%) believes that EE should be placed in the syllabus, calendar and timetable. The teacher educators in this category made three important suggestions.

- The main problem why EE is not incorporated as a cross-curricular theme in the teaching and learning situation of the Namibian Colleges of Education is because EE topics and themes are not included in the syllabus, calendar or timetable. The teacher educators placed in this response group argue that when they plan for teaching they base their plans on the syllabus, time table and calendar and it becomes easy to omit a theme which does not form part of the syllabus, time table and calendar. The teacher educators in this response group also suggest that if EE is to be one of the cross curricular themes in college and school syllabi then it should be explicitly stipulated in a

manner that makes it easier for teacher educators to incorporate it in their teaching.

- The next suggestion presented by the teacher educators is rather serious because it suggests change to the duration of the Basic Education Teacher Diploma (BETD) programme offered in the Namibian Colleges of Education. The teacher educators who made this suggestion believe that the duration of the BETD course should be changed from three (3) years to four (4) years. They assert that a three year programme as it now stands does not permit ample time for subjects already in the curriculum because adding one subject means having to reduce time on other more essential subjects related to teacher development and teaching. The solution to this problem is to introduce a four year (4) training programme in the Namibian Colleges of Education instead of the current three (3) year training programme.

- Environmental Education (EE) is an important subject that empowers knowledge about sustainability. Therefore teacher educators could know what is required of them by incorporating EE because it would help future leaders get empowered with information they could use later in life.

The fourth (4^{th}) response group (9.8%) believes that Namibia has done very little to promote EE in the schools. Various points of view were also advanced to support why Namibia has done very little to incorporate EE in the schools.

- Firstly, the teacher educators in the response group generally stated that EE should get more attention in the curriculum as it is a worldwide issue and that teachers are the ones who may reach learners through education. The teaching of EE to the world community could be spread and thus communities at the grass root level could become more useful in saving the planet.

- Secondly, the teacher educators in this response group cited the Decade of Education for Sustainable Development (DESD) which has seen very little progress in schools in line with the United Nations Education for Sustainable Development. These teacher educators assert Namibia will report little

information about DESD as a strategy for incorporating Environmental Education (EE) and mitigation of global warming in general. They assert that events in respect of the DESD happen in pockets with limited national initiative to incorporate EE in line with DESD in the schools and colleges in the country.

- The teacher educators also cited attempts made by the so-called support for Environmental Education in Namibia (SEEN) which took place from 2001-2005 but did not extend EE nationally in Namibia.

The fifth (5th) response group (7.3%) believes that the incorporation of EE is possible in some grades and subject areas. Some of the teacher educators in this response group assert that the integration of EE is applicable in grades 1-4 because it is part of the existing school curriculum in those grades. The teacher educators contend that there are too many things to be implemented and they would not find time for all of them. The curriculum is overloaded and a balance should be struck through thematic teaching. Other teacher educators stated that the teaching of EE is taking place in the Namibian Colleges of Education through Social Studies and Natural Sciences. It also takes place in Education Theory and Practice (ETP) though emphasis is put on the cross-curricular teaching of the Human Immune Virus/ Acquired Immune Deficiency Syndrome (HIV/AIDS). Some educators in this response group stated that EE must be incorporated in the subjects like Social Sciences, Agriculture, Life Science and Natural Sciences. Syllabuses for these subjects must be revisited once again to incorporate EE topics and must clearly indicate how formative and summative assessment of EE themes could be done. EE should be considered seriously just like another theme or topic.

It can be deduced that these teacher educators in this category do not support interdepartmental collaboration as a means of incorporating EE in the Namibian Colleges of Education.

The sixth (6th) response group (4.9%) believes that enough is being done to promote EE in the Namibian education system. The teacher educators in this response group

gave a variety of reasons to explain why enough is being done to incorporate Environmental Education (EE). These are:

- That the Namibian subject syllabi include many cross-curricula themes such as Population Education, Health Education and that EE is also included in the Namibian education curriculum as one of the cross-curricular themes. EE also featured in languages through different components like literature and language use.

- That EE is a cross-curricular theme in the curriculum of the Lower Primary Education and is also a theme in the Environmental Studies subject of that phase. In this phase teacher educators make use of thematic teaching which makes it even easier to incorporate EE.

- That EE is already incorporated in Natural Sciences and Health Education at the primary school level. EE is also incorporated in the secondary school in subjects like Agriculture and Life Science.

The three (3) reasons pointed out above convinced the teacher educators in this response group to believe that enough is being done to incorporate EE in the Namibian education system. However, the teacher educators in this response group also believe that the Namibian education curriculum includes EE as one of the cross curricular themes but the onus remains that of the teacher educator to deal with it deeply. These results show that teacher educators in this response group strongly support the current status of EE in the Namibian Colleges of Education.

The seventh (7^{th}) response group (2.4%) believes that teacher educators should take learners to environmentally threatened areas. Similarly, assertions were also made to justify why teacher educators should take learners to environmentally threatened areas. One is to make the effects of environmental destruction real and to enable them to gain practical experience which they can use in schools after completion of their pre-service teacher training. This educational experience should be followed by

an analysis of the situation and exploration of possible solutions that could help alleviate problems. Possible solutions should be recorded and conclusions made available to other learners and teacher trainees regarding the effects of environmental destruction in the country.

In this category one could see that some teacher educators in the Namibian education system are informed about environmental destruction in Namibia and are aware that field trips and hands on experience is the best way to learn *about, for* and *in/ through* the environment.

5.7 SUMMARY

This chapter has presented the results of the study. It was structured around five parts of the questionnaire (see Annexure III). The first part presented demographic information which included the names of the colleges of education, departments and the subjects they teach. The second part presented the results about the incorporation of Environmental Education (EE) in the Namibian Colleges of Education. These results focus on the incorporation of EE curriculum goals in the Namibian Colleges of Education.

The next part also focused on the results about the concept of cross-curricular teaching as a model for the incorporation of EE in the Namibian Colleges of Education. The results also showed different ways in which teacher educators perceive the concept of cross curricular teaching. The reasons for not incorporating EE have been explained and presented. The last part presented the results about teacher educators' final responses regarding the incorporation of EE in the Namibian Colleges of Education. The responses were varied because they consisted of those teacher educators who supported the incorporation of EE as well as those who resisted its incorporation in the Namibian Colleges of Education

The next chapter presents the summary, conclusions and recommendations for the effective incorporation of EE in the Namibian Colleges of Education.

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS FOR INCORPORATING EE IN THE NAMIBIAN COLLEGES OF EDUCATION

6.1 INTRODUCTION

This chapter presents the summary of findings, conclusions and recommendations for incorporating Environmental Education (EE) in the Namibian Colleges of Education. The chapter consists of five (5) parts. The first (1st) part discusses the summary of findings and conclusions. The second (2nd) part presents and discusses recommendations made by the researcher to ensure effective incorporation of EE in the Namibian Colleges of Education. The third (3rd) part discusses the contributions of the study. Following is the discussion about how the problem of the study was addressed. This part further describes how the hypothesis of the study was addressed. Finally, this chapter makes suggestions for further research.

6.2 SUMMARY OF FINDINGS AND CONCLUSIONS

This part presents the summary of findings and conclusions. It is further sub- divided into five (5) sub sections. The first (1st) sub section presents the summary of findings and conclusions regarding the extent to which EE goals are incorporated in the Namibian Colleges of Education. The second (2nd) subsection presents the summary of findings and conclusions regarding teacher educators' understanding, interpretation and appreciation of the concept cross curricular teaching as a model for the incorporation of EE. Following this is the summary of findings and conclusions pertaining to constraints that hamper the incorporation of EE in the Namibian Colleges of Education. This is followed by a summary of findings and conclusions regarding conditions that would ensure the incorporation of EE in the Namibian Colleges of Education. The last section is the summary of findings and conclusions about teacher educators' final remarks regarding the incorporation of EE in the Namibian Colleges of Education.

6.2.1 Extent to which Environmental Education (EE) goals are incorporated in the Namibian Colleges of Education

There are two (2) general observations made regarding the extent to which EE goals are incorporated in the Namibian Colleges of Education. The first is that some of the teacher educators in the Namibian Colleges of Education had fairly well incorporated the subgoals while others had not at all incorporated them. This observation confirms part of the problem of the study (see paragraph 1 of section 1.3). Given that EE is not a cross-curricular teaching component in the Namibian Colleges of Education, it is fair to conclude that any subgoal that is considered by about quarter ($^1/_4$) of the teacher educators is well addressed. The other observation is that many teacher educators seem to be more comfortable with the ecological and conceptual awareness subgoals. Evaluation and investigation subgoals as well as the environmental action, training and application subgoals do not seem to be addressed by the teacher educators.

Section 6.2.1.1 – 6.2.1.4 further shows the subgoals that are and/or not incorporated in the Namibian Colleges of Education. It will also highlight the conclusions and the implications for the subgoals that are not incorporated in the Namibian Colleges of Education.

6.2.1.1 Goal 1: Ecological foundation

The presentation of findings shows that four (4) ecological foundation subgoals are incorporated in the Namibian Colleges of Education. It is concluded that these subgoals are incorporated because more than one quarter (¼) of the teacher educators had fairly well incorporated them (see table 8, Chapter 5 on page 108).

- The first (1st) subgoal addresses individuals and populations;

- The second (2nd) subgoal addresses the interaction and interdependence of natural communities;

- The third (3rd) subgoal explores the ecosystem structure, interaction and effects between living and non living organisms;

- The fourth (4th) subgoal explores man as a component of the natural systems.

Three (3) ecological subgoals are not incorporated in the Namibian Colleges of Education because more than half ($^1/_2$) of teacher educators had not at all incorporated them.

- The first (1st) subgoal is about succession;

- The next subgoal is about energy and chemical cycles;

- The last subgoal is about homeostasis.

This summary of findings above shows that there is a large number of ecological foundation subgoals that are incorporated compared to those not incorporated in the Namibian Colleges of Education. It can be concluded that some teacher educators view the transmission of knowledge about the environment, species and ecosystems as a very critical part of Environmental Education (EE) teaching.

It can also be concluded that the ecological foundation has limitations because subgoals that pertain to energy, balance and succession do not seem to have been adequately incorporated by the teacher educators. This may create a situation in which there is limited knowledge of energy transfer, balance and biological importance of organisms in the curriculum of the Namibian Colleges of Education.

6.2.1.2 Goal 2: Conceptual awareness: Issues and values

There are six (6) conceptual awareness: issues and values subgoals that are incorporated in the Namibian Colleges Education. It is concluded that these subgoals are incorporated because more than one quarter (¼) of the teacher educators had incorporated them (see also table 9, Chapter 5 on page 109).

- The first (1st) subgoal addresses sustainability and sustainable development;

- The second (2nd) subgoal communicates how people's cultural activities may affect the environment;

- The third (3rd) subgoal communicates how individual people and people in groups affect the environment;

- The fourth (4th) subgoal clarifies and identifies students' values and attitudes towards an issue or environment;

- The fifth (5th) subgoal communicates that there may be more than one way to solve an environmental problem, issue or crisis;

- The sixth (6th) subgoal communicates that the difficulty in resolving environmental problems is created by different value systems that people involved in them have.

Only one (1) conceptual awareness subgoal is not incorporated in the Namibian Colleges of Education because close to half ($^1/_2$) of teacher educators had not at all incorporated it.

- The subgoal discusses the difference between an environmental problem, an environmental issue and environmental crisis.

The summary of findings above shows that many conceptual awareness subgoals are currently addressed compared to one (1) that is not incorporated. It can thus be concluded that some teacher educators view transmitting conceptual understanding as a very critical component of Environmental Education (EE) teaching in the Namibian Colleges of Education.

It is can also be concluded that the current teaching of Environmental Education (EE) in the Namibian Colleges of Education ignores an analytic technique for understanding the difference between an environmental problem, issue and crises. The researcher is of the view that this may create a situation whereby teacher educators and their students fail to recognise the progression of environmental problems to issues and crises. Timely and appropriate interventions for solving the environmental problems, isssues and crises through education may be affected.

6.2.1.3 Goal 3: Investigation and evaluation

There is only one (1) investigation and evaluation subgoal that is partially incorporated in the Namibian Colleges of Education by nearly one quarter (¼) of the teacher educators (see table 10, Chapter 5 on page 110).

- This subgoal examines a variety of issues such as clean water, protecting forests; preserving wildlife and keeping the environment clean along with different solutions that are needed to solve those issues.

Five (5) investigation and evaluation subgoals are not at all incorporated by more than half ($^1/_2$) of the teacher educators.

- The first (1^{st}) subgoal is about problem solving skills to identify specific environmental problems, issues and crises;

- The second (2^{nd}) subgoal is about the identification of actors and stakeholders to address environmental problems, issues and crises;

- The third (3^{rd}) sub goal focuses on the identification of values and beliefs that explain people's position on environmental problems, issues and crises;

- The fourth (4^{th}) subgoal focuses on examination of the ecological costs and benefits of the designated solutions to environmental problems;

- The fifth (5th) subgoal is about identification of human costs and benefits of designated environmental problems.

The summary of findings shows that the majority of investigation and evaluation sub goals are not currently addressed. It can be concluded that the investigation and evaluation skills needed to solve environmental problems, issues and crises are not a critical component of Environmental Education (EE) teaching in the Namibian Colleges of Education.

It can also be concluded that current teaching of EE in the Namibian Colleges of Education does not incorporate collaboration, problem solving and communication as the basis for acting on environmental problems, issues and crises. This has implications for EE teaching and learning in the Namibian Colleges of Education. One implication is that teacher educators would not implicitly inculcate the message that solving environment problems, issues and crises need stakeholders and actors with diverse backgrounds and interests. The other implication is about the generation of commitment. The researcher is of the view that commitment to solving environmental problems, issues and crises requires that actors and stakeholders participate in working and agreeing on related solutions through communication. It can be seen through the summary of findings that this understanding may not be communicated well.

6.2.1.4 Goal 4: Environmental action skills, training and application

There is one (1) subgoal of the environmental action skills, training and application that is fairly well incorporated in the Namibian Colleges of Education by more than one quarter (¼) of the teacher educators (see table 11, Chapter 5 on page 111).

- The subgoal communicates the need for responsible citizenship action to solve environmental problems.

Five (5) environmental action skills level, training and application sub goals are not incorporated because about one third ($^1/_3$) to more than one half ($^1/_2$) of the teacher educators had not at all incorporated them.

- The first (1st) subgoal is about various levels of environmental action;
- The second (2nd) subgoal is identification of the environmental action categories;
- The third (3rd) subgoal is the examination of scenarios and case studies that allow learners to apply knowledge of environmental action and to choose responsible environmental action;
- The fourth (4th) subgoal is the identification of human costs and benefits of an identified environmental action;
- The fifth (5th) subgoal is about taking individuals or groups of students in order to address an environmental problem that they have identified and analysed.

The summary of findings above shows that many environmental action subgoals are not incorporated in the Namibian Colleges of Education. It can be concluded that environmental action is not a critical component of Environmental Education (EE) teaching in the Namibian Colleges of Education.

It can be concluded that the current teaching of EE in the Namibian Colleges of Education faces the challenges that has been observed by other organizations. For example, CONFITEA 1V (n.d.) states that "Linking environmental and social issues and locating environmental problems within the context of our daily lives and action are important challenges for EE" (http://www.unesco.org/education/uie/confintea/pdf/6a.pdf).The assertion above underscores the importance of linking environmental action in the EE programmes in the Namibian Colleges of Education. This is because it offers the following possibilities for promoting applied knowledge in EE. Grady, Lee, Marinac and Benson (n.d.) (http://dpi.state.wi.us/_standards/pdf/envired.pdf) suggest four broad areas of

applied knowledge that may be crucial when incorporating environmental action in the curriculum. These areas are communication skills, thinking skills, problem-solving skills, and decision-making skills.

6.2.2 Teacher educators' understanding, interpretation and appreciation of the concept cross curricular as a model for the incorporation of Environmental Education (EE) in the Namibian Colleges of Education

The findings show that there is a large number of teacher educators who are aware that EE should be taught as a cross curricular theme. These teacher educators are spread through various departments such as the Departments of Languages and Social Sciences, Agriculture and Prevocational Studies, Lower Primary Education, Education Theory and Practice. It is also shown that those who are not at all informed about the incorporation of EE are from the Department of Mathematics and Integrated Natural Sciences and the Department of Integrated Media and Technology Education.

There are three significant sources of information about the cross curricular teaching of EE. These are the Ministry of Education and Culture, seminars and workshops as well as friends and colleagues. The seminars and workshops may be those organised by the Ministry of Education and Culture while friends and colleagues may be some of the teacher educators who are interested in the incorporation of EE. It is noted that the teacher educators who never heard of EE as a cross curricular theme are mainly teacher educators in the Department of Integrated Media and Technology Education. The other sources of EE are not significant. These include Internet, print and electronic media, studies and school syllabus. The fact that only one student experienced EE through studies shows a lack of EE courses in the Namibian education system.

The teacher educators hold various views regarding the concept of cross-curricular teaching of EE. The majority of teacher educators had identified with the definition that is consistent with the teaching of EE as cross-curricular theme while some of them had not done so. These different understandings and interpretations held by

teacher educators may pose potential difficulties regarding the incorporation of Environmental Education (EE).

The teacher educators display some resistance regarding the incorporation of EE. There are those teacher educators in Lower Primary Education who favours the status quo in which EE continues to be taught through the carrier departments of Lower Primary Education, Education Theory and Practice and Languages and Social Sciences. There are some teacher educators in the Department of Integrated Media and Technology Education who do no prefer to be involved in incorporating EE in the curriculum.

6.2.3 Conditions that hamper the incorporation of EE as a cross curricular theme in the Namibian Colleges of Education

It can be concluded from the discussion and presentation of findings in Chapter 5 (table 17 on page 121) that the conditions that hamper the incorporation of EE are manifested through three (3) main categories of barriers. These barriers are categorised into institutional, situational and dispositional barriers. These are discussed individually below:

The first (1st) category of barriers is institutional barriers. The institutional barriers are perceived in this study as those barriers that prevent the incorporation of EE due to the systems of institutions or the so-called established traditions that were long held in the Namibian Colleges of Education. Institutional barriers in this study are shown by the following assertions:

- EE as a cross-curricular theme is not on the college timetable of the Namibian Colleges of Education;

- The limited scope of EE in the syllabuses offered by the Namibian Colleges of Education;

- There are no clear guidelines regarding the incorporation of Environmental Education (EE) in the Namibian Colleges of Education;

- There is a lack of interdepartmental planning in the Namibian Colleges of Education;

- There is a lack of materials and teacher training for EE.

The second (2nd) category of reasons for not incorporating EE is manifested through situational barriers. In this study, situational barriers are seen as a set of personal circumstances among the teacher educators that may hinder them from incorporating EE in the Namibian Colleges of Education. In this study the situational barriers are the following:

- There is a lack of knowledge of how to incorporate EE in the Namibian Colleges of Education;

- There is a lack of resources for the incorporation of EE in the Namibian Colleges of Education.

The other reasons for not incorporating EE in the Namibian Colleges of Education are manifested through dispositional barriers. In this study, dispositional barriers refer to teacher educators' attitudes, values and thoughts about the incorporation of EE in the Namibian Colleges of Education. These dispositional barriers are:

- Lack of interest to teach or incorporate EE in the Namibian Colleges of Education;

- Incorporating EE as a cross-curricular theme in the Namibian Colleges of Education is regarded as time consuming;

- Teacher educators in the Namibian Colleges of Education have no resources and the curriculum is overloaded;

- The subjects that are taught by some teacher educators in the Namibian Colleges of Education are not relevant to Environmental Education (EE).

The barriers discussed above are held by teacher educators in the various departments of the Namibian Colleges of Education. For example, institutional barriers are held by some teacher educators in the Departments of Mathematics and Integrated Natural Sciences, Languages and Social Sciences, Agriculture and Prevocational Studies, Lower Primary Education and Integrated Media and Technology Education. The situational barriers are held by some teacher educators in the department of Mathematics and Integrated Natural Sciences, Languages and Social Sciences and Agriculture and Prevocational Studies. The dispositional constrains are mainly held by teacher educators in the Department of Integrated Media and Technology Education.

6.2.4 Conditions that would support the incorporation of EE as a cross curricular theme in the Namibian Colleges of Education

There are many conditions that are supported by teacher educators regarding the incorporation of EE (see Chapter 5, table 19 on page 125). The most significant conditions supported by the teacher educators in the Namibian Colleges of Education are:

- In-service training on how to incorporate EE in the Namibian Colleges of Education;

- Create space for EE as a cross-curricular theme on the timetable of the Namibian Colleges of Education;

- The teacher educators in the Namibian Colleges of Education need more support from the Ministry of Education and Culture;

- The teacher educators in the Namibian Colleges of Education need better access to resources about the incorporation of Environmental Education (EE).

There are other conditions that are supported by teacher educators. These conditions and situations are not significant but are very important. These should also be embraced in the strategy to incorporate EE in the Namibian Colleges of Education. These are:

- The individual colleges in the Namibian Colleges of Education should be obligated to provide proof of how they had incorporated EE as a cross-curricular theme;

- Materials must be made available about the incorporation of EE as a cross-curricular theme in the Namibian Languages.

6.2.5 Teacher educators' final comments regarding the incorporation of EE as a cross curricular theme in the Namibian Colleges of Education

It can be concluded from the presentation of findings that there are five (5) tendencies held by teacher educators regarding the incorporation of EE in the Namibian Colleges of Education. These tendencies are resistance, scepticism, instrumentalism, problem finding and solution finding. These behavioural tendencies are now discussed because they hold essential implications for the incorporation of EE in the Namibian Colleges of Education.

Resistance is one major behavioural tendency that is observed among the teacher educators of the Namibian Colleges of Education. In the context of this study, resistance means refusal to comply with the guidelines for the incorporation of EE as a cross-curricular theme. Among the frequencies obtained, the main indicators of resistance in the Namibian Colleges of Education are shown by the following assertions:

- Enough is being done to incorporate Environmental Education (EE) in the Namibian Colleges of Education;

- The best subjects to incorporate EE are Languages and Social Sciences, Mathematics and Natural Sciences, Agriculture and Prevocational Studies;

- There are a lot of cross-curricular themes of which EE is part;

- It is impossible to incorporate EE in some grades.

It can also be concluded that EE in the Namibian Colleges of Education is channelized through the Departments of Languages and Social Sciences, Lower Primary Education and Education Theory and Practice while other Departments such as Integrated Media and Technology Education are virtually left out in the incorporation of EE in the Namibian Colleges of Education.

The second (2^{nd}) behavioural tendency held by the teacher educators is scepticism. In the context of this study scepticism means a disposition in which teacher educators doubt the possibility of incorporating EE as a cross-curricular theme in the Namibian Colleges of Education. The sceptical tendencies are shown by means of the following assertions:

- Namibian has done very little to promote EE in the schools;

- There is very little progress in Namibia with regard to the Decade of Education for Sustainable Development;

- What is happening takes place in pockets with little or no incorporation across the curriculum.

Instrumentalism is the third (3^{rd}) behavioural tendency that is held by teacher educators. Instrumentalism is referred to here because there are some teacher educators who regard EE as an instrument or a means that could be used to achieve

a desirable quality of life for all. Instrumentalism is portrayed in the following observed frequencies presented by the teacher educators. These are:

- Environmental Education (EE) provides vital knowledge that could save the world from environmental degradation and destruction;
- EE empowers learners to take care of the environment;
- EE helps in the development of language skills;
- EE helps to prevent global warming, climate change and ozone destruction;
- EE helps learners to understand the interdependence of human beings;
- EE provides vital knowledge to those who are not in the Mathematics and Integrated Natural Sciences Department.

The fourth (4^{th}) behavioural tendency held by teacher educators is problem identification. This consists of teacher educators who establish the identity and difficulty that prevents the incorporation of EE in the Namibian Colleges of Education. This tendency is exhibited by the following assertions:

- EE is not incorporated because it is not clearly stated on the syllabus;
- Educators do not know how to incorporate EE in the Namibian Colleges of Education;
- Ministry of Education and Culture should be very much involved in EE incorporation.

The fifth (5^{th}) behavioural tendency is solution identification with regard to the incorporation of EE. Solution identification refers to the establishment of the identity, remedy and solutions that would ensure the effective incorporation of EE in the

Namibian Colleges of Education. The following assertions demonstrate this tendency:

- The curriculum experts must review the curriculum;
- Teacher training must be provided;
- There must be a sustained programme of workshops and seminars;
- The students should make visits to environmentally threatened areas.

The above tendencies shown by the teacher educators in the Namibian Colleges of Education demonstrate the priorities of the teacher educators in the Namibian Colleges of Education with regard to the incorporation of Environmental Education (EE). It shows that the teacher educators have different backgrounds, perceptions and beliefs about the incorporation of EE. These different backgrounds, perceptions and beliefs held by the teacher educators could be harmonized and serve as the basis for the incorporation of EE in the Namibian Colleges of Education.

6.3 RECOMMENDATIONS

6.3.1 Recommendation one (1): Appoint an educational specialist on sustainable development at the Namibian Colleges of Education

The first thing that should be done to incorporate EE is to appoint an education specialist on sustainable development. This recommendation is inspired by sources such as Neal & Palmer (1994: 105) and Robinson & Wolfson (1982: 46) that recommended the appointment of an EE Coordinator. The Coordinator works as an academic and administrator in order to establish and implement a programme for EE. The researcher suggests that the education specialist on sustainable development be appointed from the existing departments of the Namibian Colleges of Education.

Amidst the duties that should be offered by the education specialist on sustainable development, the following duties must stand out because they include theoretical positions essential in creating a sustainable society in the 21st century. These are:

- He/she should embrace all functions that are served by the traditional Environmental Education (EE) Coordinator such as that of introducing EE on the time table;

- The specialist should articulate the theories of sustainability such as sustainable Living (SL) and sustainable development (SD) and then incorporate them into the education curriculum;

- He/ she should articulate the theories and values of modern environmentalism in the curriculum of the Namibian Colleges of Education;

- The specialist should work closely with the Administration of the Namibian Colleges of Education to implement a vision for sustainable development;

- He/she should also advise the teacher educators in the Namibian Colleges of Education on various ways in which their learning areas could contribute to the teaching of EE;

- He/ she should work to harmonize the various understandings, views and perspectives of the teacher educators regarding EE and prepare a professional development plan for teacher educators;

- He/she should set up and communicate a strategy together with the administration of the Namibian Colleges of Education that offers opportunities for learning *about, for* and *in/ through* the environment.

The appointed education specialist for sustainable development should not be isolated from other initiatives that are currently taking place in Namibia in order to support education of sustainable development (see Ministry of Education & Culture,

2009). Therefore, it is recommended that he/she should be linked with the current projects and international initiatives operating under the UNESCO's Decade of Education for Sustainable Development to implement changes that are desired in the Namibian Colleges of Education and the country (see http://www.gdrc.org/sustdev/un-desd/un-resolution.html)

6.3.2 Recommendation two (2): the concept of 'cross-curricular teaching' and 'sustainable development' should be clarified clearly and unambiguously

The concept of sustainable development should be clarified in relation to the concept of cross-curricular teaching in Environmental Education (EE). The clarification is important because the researcher is of the opinion that the concept of 'sustainable development' and 'cross-curricular teaching' reveals a similarity that should be explored and understood in the process of incorporating EE. Although literature sources express this similarity, they do not emphasise and highlight the similarity that exists between these fundamental concepts for EE. The assertions below may help to clarify and expose the similarity between these concepts in EE.

Many authors wrote on the topic of 'sustainability' and expressed that the issue of sustainability is a complex field that touches upon all disciplines in education or any other organization. One of those authors is Bosselmann (2001: 175) who states that "the concept of sustainable development is so complex that – even in relation to local organization - it cannot be dealt with within a single discipline". This assertion shows that sustainability is a complex field of operation that needs to be tackled by a variety of subject areas and departments. The concept of 'cross-curricular teaching' reveals similar conceptualisations because it is an educational premise that touches on different fields and subjects in the area of education. Neal & Palmer (1994:31) maintain that "arrangements for the inclusion of cross-curricular issues as a whole cannot be left to the particular individual members of staff". This assertion confirms that cross-curricular teaching does not reside with one subject and department or some members of staff. It addresses the pervasive nature of cross-curricular teaching in that it brings on board a number of operators in the field of education to work together on one theme. The assertions above show that 'cross- curricular

teaching' simply means various subject areas and departments working or cooperating with the other subject areas or units in order to explore one theme.

The notion of cross-curricular teaching is well known in the Namibian education system but it is not always associated with sustainable development. The researcher recommends that the strategy to incorporate Environmental Education (EE) in the Namibian Colleges of Education should embrace the clarification and similarity that exist between these concepts. The specialist on education for sustainable development should keep on articulating this notion until the message is adequately internalised.

6.3.3 Recommendation three (3): The administration of the Namibian Colleges of Education should be reoriented to incorporate a wider policy and strategy on environmental education that is similar to the corporate environmental strategies which a number of companies are adopting

The administration of the Namibian Colleges of Education should be reoriented in order to rise to the challenges faced by EE in Namibia in general and Namibian Colleges of Education in particular. The researcher agrees with the Report of a Committee on Environmental Education in Further and Higher Education, appointed by the Department for Education and the Welsh Office (1994:88) that believes that "an institution's policy on environmental *education* should be developed within the context of a wider strategy akin to the corporate environmental strategies which a rapidly increasing number of companies are adopting for improving *all* aspects of its environmental performance".

The researcher recommends that the administration of the Namibian Colleges of Education adopt a policy on sustainable development because it is a new paradigm that all institutions should embrace (see table 5 in Chapter 3 on page 69). It could also serve as a wider strategy that could support Environmental Education (EE). The researcher believes that such a policy would improve environmental performance and in this way, EE whose ultimate aim is to achieve sustainable development stands to benefit. The following five (5) step strategy on policy for sustainable development could be followed in order to create an enabling environment for EE:

The first (1st) step is the identification of the mission and objectives of sustainable development. Firstly, the mission and objectives statement of the Namibian Colleges of Education should unambiguously state the definition of sustainable development. The generic definition of sustainable development should be considered as the basis for understanding sustainable development (see Chapter 2, section 2.2.2.3). The mission and objectives statement of sustainable development should also state the driving forces and imperatives for sustainable development.

The second (2nd) step is identification and integration of focus areas that could substantially support sustainable development. The focus areas may vary from college to college. The focus areas that are suggested here include natural resources and biodiversity, water and land, energy, air quality and social development action. These focus areas are now discussed briefly.

The first (1st) focus area is the natural resources and biodiversity. Natural resources are normally classified into renewable and non-renewable resources. Renewable natural resources could be added through the provision of a new supply. The non renewable resources include all those resources that become exploited and could never be added through the provision of a new supply.

The strategies to manage natural resources and biodiversity include but are not limited to increasing and supporting the biological diversity by planting trees, protecting the territorial identity of one's own local environment, respecting and regularly visiting protected areas such as parks, protecting ground water reserves and discouraging overharvesting of resources. This strategy should also include the selling of seedlings and offsprings of indigenous plants and animals to generate income. It should also include recycling paper, recovering used items and selling them to corporate institutions that are willing to buy them.

The second (2nd) focus area is energy. Energy is required on a daily basis for "manufacturing and transport and for domestic heating, cooking and lighting" (Aplin, Mitchell, Cleugh, Pitman & Rich 1994: 138). The Namibian Colleges of Education use energy in offices, laboratories, classrooms and hostels. It is also used in the

lighting of classrooms, overhead projectors, data projectors and many other educational gadgets that are energy dependant.

The strategy to be incorporated in the Namibian Colleges of Education should ensure that new college buildings are insulated in order trap energy. The new buildings should be designed to allow energy from the sun pass through these buildings. This would ensure use of light energy from this source at times when electrical energy is not needed. It should be made a policy that energy efficient educational gadgets and energy saving bulbs are purchased and installed in college offices, class rooms, libraries and other institutional facilities. The acquisition of renewable energy sources such as solar geysers should become a priority.

The third (3rd) focus area is water and land. Water is needed in construction and drinking and is used in offices and laboratories. Land refers to the space that is used for office space, construction, vegetable production and entertainment. According to Wells (1996: 162) stress on land comes from sources such as rapid population growth and land use practices that result in soil degradation. Aplin, Mitchel, Cleugh, Pitman & Rich (1994: 56) maintain that land degradation is not just soil erosion. The term includes any change in the condition of land which reduces its productive potential.

The strategy for managing land and water should focus on wise use of water sourced from taps, rivers and rain. It should also encourage human activities that minimises land and water pollution and ensure that the Namibian Colleges of Education take cognisance of their pressure on fertile soils, over cultivation, overgrazing, deforestation, erosion and other forms of destruction of life support systems on land. It should include waste reduction practices and water conservation practices. The water conservation practice should encourage installation of efficient shower water heads in hostels. Other measures to support land and water management are to develop a policy on recycling of solid waste and sorting of waste. Other strategies for improved management of land and water should be considered.

The fourth (4th) focus area is air quality. Air is needed for breathing. The quality of the air eventually determines the amount of air pollution in the atmosphere. Air

pollution is the presence of substances in the atmosphere that has capacity to limit the carrying capacity of the air around us and affects the quality of human life. Wells (1996: 43) contends that the "carrying capacity of the air – that is the amount of pollutants that it can cleanse through natural processes".

There are some approaches for managing air quality. One such approach is the identification of the types of air pollution, the causes and effects as well as control mechanisms that should be put in place to avoid further air pollution and damage to the quality of the air. Information about these may be obtained from sources such as Wells (1996: 48- 62); Gupta & Asher (1998: 160) Aplin, Mitchel, Cleugh, Pitman & Rich (1994: 182- 226) and many other sources. The second strategy is to obtain, keep, process and share air quality information about areas in which a college is located. The third strategy may include reducing emissions through the use of serviced vehicles and promoting public transport because it minimises combustion. Purchasing educational facilities that do not adversely change the quality of air and use methods to reduce dust in occupied buildings should be considered. The use of bicycle transport and bio-fuelling as well as blocking private transport once a month is crucial because they may raise awareness of effect of motor vehicles on the quality of air.

The fifth ($5^{th)}$ focus area is social development. This focus area is a deliberate action that promotes education and information sharing. The social development agenda involves adopting values that support cultures of local people, involvement of all student teachers, representative council and general public. The focus area should develop and implement environmental action categories (see Chapter 2, section 2.5.4) as part of the wider strategy for sustainable development because they are currently not merited with attention in the Namibian Colleges of Education (Chapter 5, table 11 on page 111).

The next step is risk assessment. Risk assessment is a willingness to take action in order to prevent harm on the grounds that further delay could prove costly to society, nature, environment, ecosystems and life support systems and this could be unfair to future generations. Barrow (1999: 115) maintains that risk assessment "involves identifying hazards, estimating probability of occurrences, evaluation of the

consequences, using the findings to assess risks, presenting conclusions". Risk assessment as conceived here is consistent with the precautionary principle of sustainable development which was incorporated into the 1992 Rio Declaration stating that "where there are threats of serious or irreversible damage, lack of full understanding shall not be used as a reason for postponing cost effective measures to prevent environmental degradation" (Selman, 1996: 15). O'Riordan developed six (6) principles of the sustainable development world to help policy makers put the precautionary principle into practice (Carter (n.d.) http://www.fathom.com/course/21701763/session3.html. These principles may be of interest and relevance to the Namibian Colleges of Education. They are as follows:

- Where unambiguous scientific proof of cause and effect is not available, it is necessary to act with a duty of care;

- Where the benefits of early action are judged to be greater than the likely costs of delay, it is appropriate to take a lead and to inform society why such action is being taken;

- Where there is the possibility of irreversible damage to natural life support functions, precautionary action should be taken irrespective of the foregone benefits;

- Always listen to calls for a change of course, and incorporate representatives of such calls into deliberate forums and maintain transparency throughout;

- Never shy away from publicity and never try to suppress information, however unpalatable. In the age of the Internet, someone is bound to find out if information is being distorted or hidden;

- Where there is public unease, act decisively to respond to that unease by introducing extensive discussions and deliberate techniques (Economic and Social Research Council (n.d.) cited on http://www.fathom.com/course/21701763/ session3.html).

These principles are important because they focus on aspects that are relevant to environmental research and sharing of results. They advise the Namibian Colleges of Education to look for possible threats to the environment and institute actions before they get out of hand.

The fourth step (4th) is to establish partnerships with the public sector, the private sector and other local organizations that may have an interest in environmental matters in education. The Namibian Environmental Education Network (2002: ii) states that "currently there is limited communication, sharing of ideas and cooperation among the various non-formal Environmental Education (EE) practitioners in Namibia and as a result there seems to be a great deal of fragmentation". The lack of communication on environmental matters necessitates the establishment of partnerships to improve environmental performance and support environmental education. The task should also be embraced by the specialist on education for sustainable development

In the public sector, the Ministry of Education and Culture, the Ministry of Environment and Tourism, the Ministry of Agriculture and Water and Rural Development, the Ministry of Mines and Energy and others should be central partners in support of environmental performance and EE in the Namibian Colleges of Education. They have the potential to provide substantial support to the Namibian Colleges of Education through the provision of competitions, information on environmental matters, sponsoring workshops and sensitizing teacher educators and student teachers on environmental issues pertaining to their respective operations. In the same way, the specialist on education for sustainable development should seek support of the private sector and Local Government Authority (LGA) on environmental matters that are relevant and central to their operations.

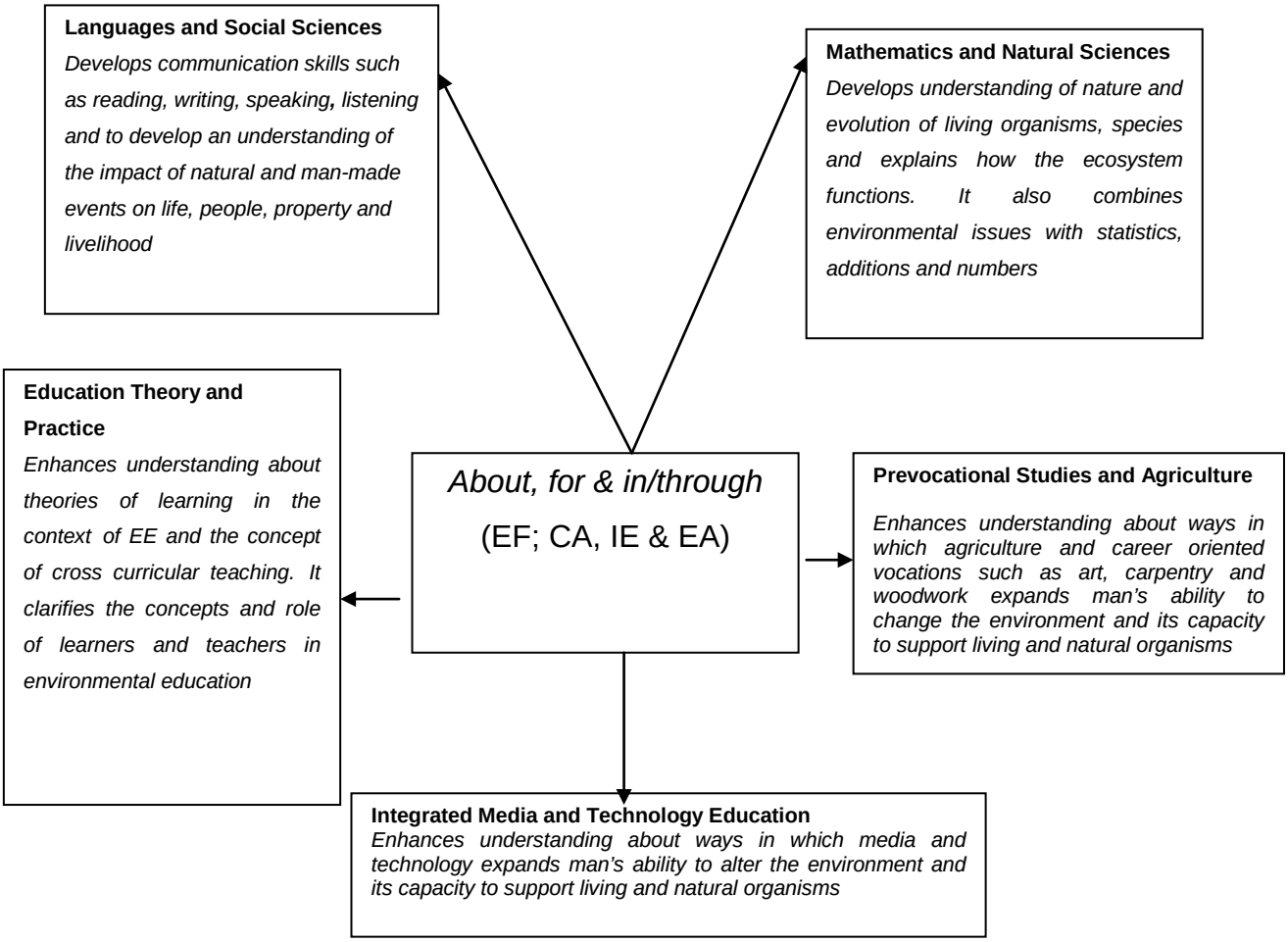
The fifth (5th) step is to ensure that there is continuous reporting and communication on social, environmental and economic issues of the college. This reporting ensures that all stakeholders are informed timeously about its successes on those matters. This requirement must be preceded by regular social, environment and economic audits.

6.3.4 Recommendation four (4): The curriculum of the Namibian Colleges of Education should be re-oriented to incorporate all the Environmental Education (EE) curriculum goals and all the dimensions of EE.

6.3.4.1Curriculum

It is recommended that the five (5) learning areas (see also figure 3, Chapter 5 on page 106) should focus on promoting the infusion approach to the incorporation of EE (see Chapter 2, section 2.4). The Lower Primary Department is not shown here because it is believed that all these knowledge areas could permeate through it. Figure seven (7) shows how the various learning areas could promote the incorporation of EE.

Figure 7: The contribution of learning areas in the Namibian Colleges of Education to EE teaching, learning and research (developed by Kanyimba, February 2009)



The centre of the figure also shows four (4) Environmental Education (EE) curriculum goals that should be incorporated alongside the dimensions. These are the ecological foundation (EF), conceptual awareness (CA), investigation and evaluation (IE), and environmental action (EA). The relationship between the EE curriculum goals and three dimensions of EE was also illustrated in Chapter 2, sections 2.5.1- 2.5.4.

The researcher suggests that these aspects be introduced in the timetable of those learning areas alluded to above. In each teaching term, the topics selected from the four (4) EE goals must be taught. This should be organized during cross-curricular weeks every term. The education specialist should guide all teacher educators to plan, teach and evaluate EE topics through their subjects in each learning area. This process should continue until all the sub goals of EE are covered.

The infusion (multidisciplinary) approach explained above does not replace the single subject (interdisciplinary) approach (see figure 1 and table 2, Chapter 2, pages 35-36).The single subject (interdisdiplinary) approach also appears to be the approach by which EE is currently incorporated in the Namibian Colleges of Education but is limited by its failure to include some EE curriculum goals (see sections 6.2.1- 6.2.4). The researcher recommends that the interdisciplinary incorporation of EE may still be used but the content of programmes should be re-structured to incorporate the four (4) goals of EE (see chapter 2, section 2.5).

6.3.4.2 Methods

Some of the teaching methods suitable for the incorporation of EE in the Namibian Colleges of Education are discussed in table 22.

Table 22: Teaching methods suitable for the incorporation of Environmental Education (EE) in the Namibian Colleges of Education

Method	Purpose	How teacher educators may use the method in the Namibian Colleges of Education
Lecture/ Presentation	To provide a large amount of information *about, for, in/through* the environment in a limited amount of time	- Prepare a detailed outline/ plan on an environmental topic - Organise EE content and structure in a logical way - Use teaching aids such as chalkboard, white board, models and overhead projector(etc) to add clarity and variability - Involve learners through questions
Symposium	To provide a variety of viewpoints on an EE topic from a panel of experts	- Identify an E E topic, issue or problem to be discussed - Select panellists with a diversity of background and experiences in EE - Have each panellist prepare a brief presentation on the EE topic - Arrange the learning environment with the learners in mind - Let the panellists participate in a panel discussion - Plan a follow up discussion
Group discussion	To provide an opportunity for learners to think together constructively for purposes of learning, solving problems, making decisions and improving human relationships on environmental matters	- Select an EE topic with learners - Prepare objectives that should be achieved - Prepare a list of questions that will stimulate thinking and to examine learners beliefs and values on that environmental topic - Establish an atmosphere in which the learners have an opportunity to participate and share their views, beliefs and values
Case study	To provide an account of an actual environmental problem or a situation that an individual or group have experienced	- Present the case study in writing with questions that will generate discussion - Establish an atmosphere that require equal opportunity for all to participate in the discussion surrounding the case study
Problem solving	To provide the opportunity for each learner to solve an environmental problem, issue or crisis through the collection, assessment and application of information	- Choose environmental problems, issues and crises that are relevant to the lives of the learners - Follow systematic steps (define the problem, collect data, find solutions, implement solutions and evaluate the outcome) - Have learners collect data from a variety of sources - Learners summarise what they have learnt from the problem
Tour/ field trip	To provide an opportunity for learners to observe practices, problems situations, or to bring the learners into contact with persons or objects in other surroundings	- Select an area or site to be visited - State the objectives to be accomplished during the visit - Plan transportation including use of maps - Explain the special circumstances of the visit - Plan a follow up and summary

Based on Fraser, Loubser & Van Rooy (1990: 154- 161); Petty (2004: 154 - 268); and Gboku & Lekoko (2007: 175-176).

The researcher recommends the adoption of these teaching methods because most promote critical thinking, problem solving, inculcate a sense of responsibility and respect for the opinion of others in the process of learning *about, for, in/through* the environment. These methods also provide an opportunity for teacher educators to bring in experts from the surrounding community.

6.3.4.3 Resource

The concept 'resource' is used here to refer to materials that are used to support the teaching and learning of EE. Braus & Wood, (1993: 33); and Murdoch (1993: 189-192) indicate that the concept 'resource' in EE could be used to describe organisations that provide useful information about environmental issues. It can also be used to refer to teaching media such as posters, pencils, papers, books, series, local areas as resources and networking. Cammozi & Apel (1996: 160) use the word media to capture those things that we get from nature in order to satisfy the needs and wants in education. These authors classify media into traditional media and modern media. According to these authors traditional media refers to announcements in the market places, theatre, puppet theatre, stories and dances. Modern media refers to films, reports in newspapers, music, posters, self made journals and leaflets, reports on television (TV), educational radio, slogans on T-shirts, caps and other clothing items.

The discussion above shows that a resource may be designed by teacher educators and other types may be produced. It is shown that the environment itself is a resource for learning and teaching. This understanding should be emphasized in the in-service training of teacher educators.

6.3.4.4 Evaluation

The following checklist must be considered by teacher educators when evaluating the content of EE:

- Have I covered the aims and objectives of EE;

- Have I planned tasks that promote critical thinking, problem solving and decision making in Environmental Education (EE);

- Have I planned tasks which help learners to learn *about* the environment;

- Have I planned tasks which involve learning *in* or *through* the environment;

- Have I planned the activities which involve learning *for* the environment;

- What specific elements and levels of knowledge and understanding are covered by learning tasks;

- Do tasks generate actions by encouraging individuals to take responsibility and care for the environment;

- What attitudes do I aim to promote through planned learning activities;

- How do I ensure that the tasks and experiences build on each other in a progressive way in each of these components of the overall model (Based on Environmental Education Curriculum Guide, 1993: 49 and Neal & Palmer, 1998: 153).

These key questions encourage teacher educators to give diverse tasks that mostly promote problem solving, critical thinking and environmental action.

6.3.5 Recommendation five (5): The attitudes and values of the teacher educators should be re-oriented to support the incorporation of EE as a cross-curricular theme

It is recommended that teacher educators' attitudes in the Namibian Colleges of Education should be reoriented in order to support the incorporation of EE. Wager, Applefield, Earl & Dempsey (1990: 47) define the term attitude as a "psychological state that predisposes one to act in specific ways toward people, things, events or ideas". It is evident in the above definition that attitudes may predispose teacher educators to incorporate EE or not incorporate EE in the Namibian Colleges of

Education. Macmillan (2001: 265) argues that values are conditions and aspects of ourselves and our world that we want, such as a safe life, freedom, happiness, social acceptance and wisdom. The definition expresses that values determine conditions that we want.

The strategy for the enhancement of attitudes and values must have tripartite levels. The first is persuasive message. Persuasive messages change perceptions, increase awareness, knowledge, values and a sense of duty to Environmental Education (EE). It may be relevant when information about the incorporation of EE is provided to the teacher educators. Secondly is modelling. Modelling generates social trust and social pressure. The education specialist may use modelling to show best practices in EE incorporation. Last is the reinforcement of the behaviours that is consistent with the incorporation of EE in the Namibian Colleges of Education. Reinforcement generates incentives and social status. The specialist on education for sustainable development may use it to give certificates of recognition to individuals and colleges committed to EE incorporation.

6.3.6 Recommendation six (6): In-service training for teacher educators in the Namibian Colleges of Education

The researcher recommends in-service training for teacher educators and administrators. The in-service training for teacher educators should mainly focus on raising all the teacher educators' knowledge and the administrators' knowledge and understanding about sustainable development and environmental quality, increasing the awareness of environmental issues and problems, improving the environmental performance of the Namibian Colleges of Education, increasing the knowledge about the cross-curricular implementation of EE themes in the curriculum, using methods and providing optimum Environmental Education experiences for learners through the use of own teaching materials, new teaching strategies and approaches.

Secondly, the institutions that provide higher education such as the University of Namibia (UNAM) and Polytechnic of Namibia (PoN) should be urged to develop postgraduate level training courses for teacher educators in EE. They should also incorporate EE modules in their teacher training programmes. Through postgraduate

education, teacher educators could also receive higher level pre-service and in-service training on Environmental Education (EE).

6.4 CONTRIBUTIONS OF THE STUDY

One of the contributions of this study is that it merges the four (4) EE curriculum goals with the three (3) dimensions of EE. These dimensions of EE alluded to here are education *about, for, in/through* EE. This merger is explained in Chapter 2, sections 2.5.1- 2.5.4. From the merger, the educational activities that are intended to promote sustainable development in the Namibian Colleges of Education could be designed.

The other contribution of the study is that it provides clarity about the relationship between the concept of 'cross-curricular teaching' and the concept of 'sustainable development' (see recommendation 6.3.2). The study also urges the authorities in the Namibian Colleges of Education to view the paradigm of cross-curricular teaching as synonymous to the paradigm of sustainable development.

The results of the study also make an important contribution because they identify reasons for not incorporating EE (see table 17, Chapter 5 on page 121) in the Namibian Colleges of Education. These may be used as part of the strategy to effectively incorporate EE in the Namibian Colleges of Education.

The recommendations of the study also provide an important contribution because the Namibian Colleges of Education are urged to adopt a policy for sustainable development suggested (see recommendation 6.3.3), to re-orientate the curriculum, to provide a programme for attitude learning, in-service training and partnerships in EE.

6.5 HOW THE PROBLEM OF THE STUDY WAS ADDRESSED

In addressing the problem of the study (Chapter 1, section 1.3), the researcher identified barriers that affect the incorporation of Environmental Education (EE). These have been noted and discussed as institutional, dispositional and situational barriers (see subsection 6.2.3).

There are six (6) recommendations that are made in this study. The recommendations (see sections 6.3) clearly demonstrate the strategy that should be implemented in order to incorporate EE in the Namibian Colleges of Education.

6.5.1 How the hypothesis of the study was addressed

The findings of the study addressed the hypothesis of the study (see Chapter one (1) section 1.4) because table nineteen (19) in Chapter 5 on page 125 shows that 40.3% of the teacher educators prefer training and education as a strategy to incorporate EE in the Namibian Colleges of Education.

6.6 SUGGESTIONS FOR FURTHER RESEARCH

- One aspect for further research should examine deeper social and psychological reasons why some of the teacher educators are not interested in teaching EE;

- The other area that needs further investigation is the exploration of why problem solving is not a critical component of EE teaching in the Namibian Colleges of Educatiion;

- There is a need for a publication about the nature of EE resources in Namibia. This should be made available to the Namibian Colleges of Education.

6.7 SUMMARY

This chapter has discussed the summary of findings, conclusions and recommendations for incorporating Environmental Education (EE) in the Namibian Colleges of Education. The summary of findings and conclusions reflects the subgoals of the EE curriculum goals and teacher educators' awareness of the concept of cross-curricular teaching. The summary of findings and conclusions about reasons for not incorporating EE in the Namibian Colleges of Education are also shown. It also shows the conditions that would support the incorporation of EE and the teacher educators' final comments regarding the incorporation of EE in the Namibian Colleges of Education.

The chapter discussed the contributions of the study.

The chapter also discussed recommendations that should be implemented in order to incorporate EE in the Namibian Colleges of Education. The chapter also explained how the problem and hypothesis of the study were addressed. Suggestions for further research are also indicated.

REFERENCE LIST

Acar, C. 1993. Environmental Education in the Primary School Science Curriculum in Uganda in M. Hale (Ed). *Ecology in Education*: 23 –34. Cambridge: Cambridge University Press.

African Bird Club. (n.d.) [On line] http://www.africanbirdclub.org/countries/Namibia/ conservation.html

Agenda 21. (n.d.) *Resources*. [On line] (http://www.iol.ie/~isp/agenda21/watsa21.htm

Airasian, P.W. & Gay, L.R. 2000. *Educational Research, Competencies for Analysis and Application*. Sixth edition. London: Prentice Hall International

Ajiboye, J.O.; Mansaray, A. & Audu, U.F. 1998. Environmental Knowledge and Attitudes of Some Nigerian Secondary School Teachers. *Environmental Education Research*, 4 (3): 329-339.

Amukugo, E.M. 1993. *Education and Politics in Namibia*, *Past Trends and Future Prospects*. Windhoek: Gamsberg Macmillan.

Anderson, G. 1998. *Fundamentals of Educational Research*. Second edition. London: Routledge Falmer.

Aplin, G.; Mitchell, P.; Cleugh, H.; Pitman, A & Rich, D. 1994. *The Global Environmental Crises: An Australian Perspective*. Melbourne: Oxford University Press.

Arms, K. 1994. *Environmental Science*. New York: Saunders College Publishing.

Armstrong, K. (n.d.) *Population Dynamics and the Human Impact.* [On line] http://www.msu.edu/~armst146/populationbigideas.html

Ary, D.; Jacobs, L.CH & Razavieh, A. 1979. *Introduction to Research in Education*. Second Edition. New York: Holt, Rinehart and Wiston.

Babbie, E. & Mouton, J. 2001. *The Practice of Social Research.* Cape Town. Oxford University Press, Southern Africa.

Bailey, K.D. 1987. *Methods of Social Research.* London: Collier Macmillan Publisher.

Barbier, E.D. 1991. Environmental Degradation in the Third World in Pearce, D. (Ed). *Blueprint 2, Greening the World Economy*: 75-108. London: Earthscan Publications Limited.

Barnhill, D.L. (n.d.) *Deep Ecology*. [On line] http://www.eoearth.org/article/Deep_ecology. The encyclopaedia of Earth: Content, Credibility and Community.

Barrow, C.J. 1999. *Environmental Management, Principles and Practice.* London: Routledge.

Bartelmus, P. 1994. *Environment, Growth and Development. The Concepts and Strategies of Sustainability*. London; Routledge.

Bassey, M. 1999. *Case Study Research in Educational Settings*. Buckingham: Open University Press.

Bates, K. (n.d.) *What is going on in Darfur*? [On line] http://www.tedallas.org/socialjustice/dollsfordarfur/article.html

Bennett, D.H. 1993. Shaping Survival: Environmental Ethics and Environmental Education in Bandhu, D.; Bongartz, H.; Ghaznawi, A.G & Gopal, B. (Eds). *Environmental Education for Sustainable Development, Proceedings on the Global Forum*: 105 -12. New Delhi: Indian Environmental Society.

Best, J.H & Kahn, J.V. 1993. *Research in Education.* Boston: Allyn & Bacon.

Best, J.W. & Kahn, J.V. 1998. *Research in Education.* Eighth edition. London: Allyn & Bacon

Bieger, R.G. & Gerlach, G.J. 1996. *Educational Research, a Practical Approach.* Delaware: Delmar Publishers.

Bless, C. & Higson- Smith, C. 2000. *Fundamentals of Social Research, An African Perspective,* 3rd edition. Landowne: Juta education (pty) Ltd.

Bornman, G.M. 1997. Environmental Education and the School Curriculum: a South African Perspective. *Educare:* 26 (1&2) 56-67.

Bornman, G.M. 1997. *Towards the Integration of Environment Education in the South African Secondary School Curriculum*. Unpublished D.Ed thesis. Pretoria: UNISA.

Bosselmann, K. 2001. University and Sustainability: Compatible Agendas? *Journal of Educational Philosophy and Theory*: 33 (2): 167-186.

Boulding, K.E. 1966. The Economics of the Coming Spaceship Earth in Jarret, H. (Ed) *Environmental Quality in a Growing Economy. Baltimore:* John Hopkins University Press. [On line] www.dieoff.org/page160.htm

Braus, J.A. & Wood, D. 1993. *Environmental Education in the Schools, Creating a Program that Works.* Pearce Corps: Information Collection and Exchange.

The Britannica Concise Encyclopaedia. (n.d.) *College* [On line] http://www.answers.com/topic/college

Brown, L. (Ed). 1993. *The New Shorter Oxford English Dictionary, On Historical Principles*. Oxford: Clarendon Press.

Brown, C. 1996. The Outlook for the Future in Namibia in Tarr, P. (Ed). *Namibia Environment,* volume 1. Windhoek: Commercial Bank of Namibia.

Camozzi, A. & Apel, H.1996. *Adult Environmental Education, a handbook on Context and Methods*. Bonn: Deutschen Volkshochshul- Verbandes (DVV)

Carl, A.E. 1995. *Teacher Empowerment through Curriculum Development: Theory into Practice*. Kenwyn: Juta & Company.

Carter, N. 2001. The *Politics of Environment, Ideas, Activism, Policy.* Cambridge. Cambridge University Press.

Carter, N. (n.d.) *Understanding Sustainable Development* [On line] http://www.fathom.com/course/21701763/session3.html.Cambridge: Cambridge University Press.

Clover, D. 1996. Developing International Environmental Adult Education: The Challenge, Theory and Practice in Filho, W.L; Murphy, z & O'Loan, K. (Eds). A Sourcebook for Environmental Education, *a Practical Review Based on the Belgrade Charte*r: 92-109. London: The Parthenon Publishing Group.

Clover, D. 2000. Educating for change: Reconceptualising Formal and/ or Non-formal Environmental Education. *Comparative Education Review*. 44 (2):213-219.

Cock, J. 1991. Going Green at the Grassroots, the environment as a political Issue in Cock, J & Koch, E. (Eds). *Going Green, People, Politics and Environment in South Africa*: 1-20. Cape Town: Oxford University Press.

Coetzer, I.A. 2007. An Exploratory Survey of Important Aspects of the Ecosystem and Species Approach for Environmental Education Programmes. *Journal of Educational Studies*: 6 (1):1-8.

Compton's Encyclopedia. 2000. *Compton's Encyclopedia,* Volume 1. Chicago: Success Publishing Group LTD.

Compton's Encyclopedia. 2000. *Compton's Encyclopedia,* Volume 6. Chicago: Success Publishing Group LTD.

Compton's Encyclopedia. 2000. *Compton's Encyclopedia,* Volume 16. Chicago: Success Publishing Group LTD.

CONFITEA IV. (n.d.). *Adult Environmental Education: Awareness and environmental action* [On line] http://www.unesco.org/education/uie/confintea/pdf/6a.pdf

The Constitution of the Republic of Namibia.2007. Windhoek: Ministry of Information and Broadcasting.

Corbetta, P. 2003. *Social Research Study, Theory, Methods and Techniques*. London: SAGE publications.

Cornwell, L. 1996. Environmental Education at Training and the Community Level. *Africanus, 26 (1): 81-88.*

David, M. & Sutton, C. 2004. *Social Research, the Basics*. London: SAGE Publications.

Da Silva, C. 1996. Building Bridges: Traditional Environmental Knowledge and Environmental Education in Tanzanian Secondary Schools in Filho, W.L; Murphy, Z & O'Loan, K. (Eds). *A source book for environmental education, A Practical Review Based on the Belgrade Charter*: 112- 133. New York & London: Parthenon Publishing Group.

Degenaar, J.P. 1988. Environmental Education as Part of the School Curriculum. *Spectrum: 26 (3):45-47.*

Dempsey, R.; Gresele, CH.; Bögeholz*, S.;* Martens, TH.; Mayer, J.; Rode, H & Rost, J. 1997. Empirical Studies on Environmental Education in Germany: Contributions by the Institute for Science Education. *Research in Science Education*: 28(2): 259-279.

Dendiger, R.S. & McKeown-Ice, R. 2000. Socio-Political-Cultural Foundations of Environmental Education. *Journal of Environmental Education*, 31 (4):37-45.

Devall, F. & Sessions, G in Barnhill, D.L (n.d.) *Deep Ecology*. [On line] http://www.eoearth.org/article/Deep_ecology. The Encyclopaedia of Earth: Content, Credibility and Community.

Devi, L. (Ed). 1996. *The Encyclopedia of Educational Development and Planning.* New Delhi: Institute for Sustainable Development.

Diouf, J. 2002. Education for All and Poverty Eradication for Rural Population in UNESCO. *Education for a Sustainable Future : Commitments and Partnerships, Proceedings of the High-Level International Conference on Education for Sustainable Development at the World Summit on Sustainable Development* : 61-64. Johannesburg : UNESCO.

Donald, D.; Lazarus, S & Lolwana, P. 2002. *Educational Psychology in Social Context, Challenges of Development, Social Issues and Special Needs in Southern Africa.* Second edition. Cape Town: Oxford University Press, Southern Africa.

Dreyer, J. M. 1996. *The Origin and Development of Environmental Education*, *Study Manual for the Further Diploma in Education: Environmental Education.* Pretoria: Unisa Press.

Dunster, J. & Dunster, K. 1996. *The Dictionary of Natural Resource Management. The Comprehensive, Single Source Guide to Resource Management Terms.* Wallingford: CAN INTERNATIONAL.

Earth Summit. 1992. *The United Nations Conference on Environment and Development*. London: International institute for Environment and Development.

Economic and Social Research Council (n.d.) *The politics of GM food: Risk, Science and Public Trust, Special Briefing no.5.* [On line] http://www.fathom.com/course/21701763/session3.html

Encyclopaedia of Sustainable development. (n.d) [On line] http://www.ace.mmu.ac.uk/esd/Earth/Ecocentrism_and_Technocentrism.html

Energy Information Administration (EIA). (n.d.) [On line] www.eia.gov.emeu/cabs/suh africaenv.html

Environment (n.d.). [On line] http://www.environment.nsw.gov.au/waste/envguilns/composting glossary.htm

Environmental Education Curriculum Guide. 1993. *Environmental Education Curriculum Guide*. Queensland: Department of Education.

Enviro-teach. 1995. *Tools of the Trade: Skills and Techniques for Environmental Education in Namibia*. Swakopmund: Enviro-teach.

Falconi, M. (n.d.) UN: U.S., *Europe Deforestation Reversed*. Associated Press. [On line] (http://www.livescience.com/environment/070313_ap_deforestation_reverse.html

Fensham, P.F. 1992. Stockholm to Tbilisi, the Evolution of Environmental Education in Gough, A.G.; Fien, J.; Robottom, I & Spork, H. (Eds). *Founders in Environmental Education*: 61-69. Victoria: Deakin University.

Fien, J. 2002. A decade of Commitment: Lessons Learnt from Rio to Johannesburg in UNESCO. *Education for a Sustainable Future : Commitments and Partnerships, Proceedings of the High-Level International Conference on Education for Sustainable Development at the World Summit on Sustainable Development* : 75-137. Johannesburg : UNESCO.

Fien, J. (1993). *Education for the Environment, a Critical Curriculum Theorising and Environmental Education*. Victoria: Deakin University.

Fien, J. 1993. Education for Sustainable Living: An International Perspective on Environmental Education. *Southern African Journal of Environmental Education:* 7-20.

Fincham, R. & Thygesen, N. 2002. Reorienting Higher Education in the Southern African Development Community (SADC) Region in UNESCO. *Education for a Sustainable Future : Commitments and Partnerships, Proceedings of the High-Level*

International Conference on Education for Sustainable Development at the World Summit on Sustainable Development : 201-205. Johannesburg : UNESCO.

Fraser, W.J.; Loubser, C.P. & Van Rooy, M.P. 1990. *Didactics for the Undergraduate Student*. Second edition. Durban: Butterworths.

Fung (n.d.) [On line] (www.darwin.bio.uci.edu/~sustain/90/namibia.htm

Gall, M.D.; Borg, W.R. & Gall, J.P. 1996. *Educational Research, an Introduction.* Toronto: Longman Publishers, USA.

Gayford, C.G. 1998. The Perspective of Science Teachers in Relation to Current Thinking about Environmental Education. *Research in Science & Technological Education*, 16 (2): 101-113.

Gay, L.R. 1987. *Educational Research*, *Competencies for Analysis and Application.* Third edition. Toronto: Merril Publishing Company.

Gboku, M.; Lekoko, R.N. 2007. *Developing Programmes for Adult Learners in Africa.* UNESCO: UNESCO Institute for Life Long Learning.

Gebreab, F. & Bak, N. 2000. The Status of Environmental Education in Eritrean Junior Secondary Schools. *Environmental Education Bulletin, (20):8-12.*

Global Development Research Center (GDRC). (n.d.) *SD features, definitions* [On line] http://www.gdrc.org/sustdev/definitions.html.)

Goldblatt, D.1996. *Social Theory and the Environment*. Oxford: Blackwell Publishers.

Gomm, R. 2004. *Social Research Methodology, a Critical Introduction*. New York: Palm Grave Macmillan.

Grady, S.M.; Lee, S.A. & Marinac, P.A. (n.d.) *Wisconsin's Model Academic Standards for Environmental Education* [On line] http://dpi.state.wi.us/standards/pdf/envired.pdf

The Great River Institute. (n.d.) *Deep Ecology: Environmentalism as if all beings mattered* [On line] http://www.greatriv.org/de.htm

Green Beat Namibia and Environment. (n.d.) [On line] (http://www.namibian.com.na/Netstories/Environs6-98/enviroday.html

Greig, S.; Pike, G. & Selby, D. 1987. *EARTHRIGHTS. Education as if the Planet Really Mattered*. London: World Wild life Fund

Gupta, A. & Asher, M.G. 1998. *Environment and the Developing World, Principles, Policies and Management*. New York: John Willey & Sons.

Hale, M & Hardie, J. 1993. Ecology and Environmental Education in Schools in Britain in Hale, M (Ed). Ecology in Education: 10- 22. Cambridge: Cambridge University Press.

Hale, M. 1993. Sustainable Development through Environmental Technology: Education and Training Requirements in Bandhu, D; Bongartz, H; Ghaznawi, A.G & Gopal, B (Eds). *Environmental Education for Sustainable Development, Proceedings on the Global Forum*: 89-96. New Delhi: Indian Environmental Society.

Hardoy, J.G.; Mitlin, D & Satterthwaite, D. 1992. *Environmental Problems in Third World Cities.*London: Earthscan Publications Ltd.

Harris, G. & Blackwell, C. (Eds). 1992. *Environmental Issues in Education*. Arena: Ashgate Publishing Company.

Harkins. (n.d.) [On line] http://teach.valdosta.edu/are/vol5no1/Thesis%20PDF/HarkinsA_ARE_Article.pdf

Hitchcock, G.; Hughes, D. 1989. *Research and the Teacher, A Qualitative Introduction to School Based Research,* 2nd edition. London & New York: Routledge.

Hittleman, D.R. & Simon, A.J. 1997. *Interpreting Educational Research: An Introduction for Consumers of Research.* New Jersey: Prentice Hall Inc.

Hoff, M.D. & McNutt, J.G. (Eds).1994. *The Global Environmental Crisis, Implications for Social Welfare and Social Work*. Aldershot: Ashgate Publishing Limited.

Hoff, M.D. 1994. Environmental Foundations of Social Welfare: Theoretical Resources in Hoff, M.D & McNutt, J.G. (Eds) *The Global Environmental Crisis, Implications for Social Welfare and Social Work:* 12-35. Aldershot: Ashgate Publishing Limited.

Hopkins, C.D. 1980. *Understanding Educational Research*. Ohio: Bell & Howell Company.

Hornby, A.S. 1995. *The Oxford Advanced Learner's Dictionary of Current English*. Oxford: Oxford University Press.

Hoyle, R.H.; Harris, M.J. & Judd, C.M. 2002. *Research Methods in Social Relations.* Seventh edition. London: Thomson Learning.

Hungerford, H.R. & Peyton, R.B. 1994. *Procedures for Developing an Environmental Education Curriculum*, *A Discussion Guide for UNESCO Training Seminars on Environmental Education*. Revised, No 22. UNESCO/ UNEP: International Environmental Programme.

Huysamen, G.K. 1994. *Methodology for the Social and Behavioural Sciences.* Johannesburg: Internal Thomson Publishing (Southern Africa) Pty, LTD.

Irwin, P. & Lotz-Sistika, H. 2005. A History of Environmental Education in South Africa in Loubser, C.P (Ed). *Environmental Education, Some South African Perspectives*: 35-54. Pretoria: Van Schaik Publishers.

The IUCN (n.d.) *An Over view*. [On line] (http://www.iucn.org/en/about/

The Johannesburg Summit on Sustainable Development (n.d) [On line] (http://parallel.vub.ac.be/~jan/ucos_conferentie/

Kemp, D.D. 1998. *The Environment Dictionary*. London: Routledge.

Kemp, D.D. 1994. *Global Environmental Issues, a Climatological Approach.* Second edition. London & New York: Routledge.

Khosa, H.L. 2002. *Incorporation of the Environnent as a Phase Organiser in the Foundation Phase.* Unpublished M.ed thesis. Pretoria : UNISA.

Knamiller, G.W. 1987. Environmental Education in Schools in Baez, A.V.; Knammiler, G.W & Smyth, J.C. (Eds) *The environment and Science and Technology Education:* 55-77 Oxford: Pergamon Press

Kotelniko. V. (n.d.) *Sustainable Growth Strategies* [On line] http://www.1000ventures.com/business_guide/sustainabl

Lane, J.; Wilke, R.; Champeau, R. & Sivek, D. 1995. Strengths and Weaknesses of teacher environmental education preparation in Wisconsin. *Journal of Environmental Education*. Vol 27 (1):36-45.

Lebeloane, L.D.M. 1998. *A Model for An Environmentally Directed Teaching Approach.* Unpublished D.ed Thesis. Pretoria : UNISA.

Lewin, T. 2007. *Darwin.* London : Routledge.

Loubser, C.P. 1997. Cross- Curricular Teaching : An approach in the new South African School Curriculum. *Educare (*1&2) 24-34.

Loubser, C.P. 1992. Environmental Education : A Field of Study to be Taught as Subject During Teacher Training. *Educare :*21(1&2) : 90-97.

Loubser, C. P. & Le Grange, L. 2005 Education for Sustainability in Loubser, C.P. (Ed) *Environnmental Education : Some South African Perspectives* : 112-124. Pretoria : Van Schaik Publishers.

Mason, E.J. & Bramble, W.J. 1989. *Understanding and Conducting Research, Applications in Education and the Behavioral Sciences.* Second edition. New York : McGraw-Hill Book Company.

Mathews, J.A. (Ed). 2001. *The Encyclopaedic Dictionary of Environmental Change.* London : Oxford University Press INC.

Matsuura, K. 2002. Why Education and Public awareness are indispensbale for a Sustainable Future in UNESCO. *Education for a Sustainable Future : Commitments and Partnerships, Proceedings of the High-Level International Conference on Education for Sustainable Development at the World Summit on Sustainable Development* : 27-31. Johannesburg : UNESCO.

May, S.TH. 2000. Elements of Success in Environmental Education. *Journal of Environmental Education* : 31 (3): 4-11.

McEwan, E.K. & McEwan, P, J. 2003. *Making Sense of Research*. California : Corwin Press, INC.

McMillan, J.H. 2001. *Classroom Assessment, Principles and Practice for Effective Instruction.* Second edition. London : Allyn and Bacon.

Melograno, V.J. 1996. *Designing the Physical Education Curriculum.* Third edition. Leeds : Human Kinetics.

Merriam, S.B. 1998. *Qualitative Research and Case Study Applications in Education, Revised and Expanded from Case study Research in Education*. Second edition. San Francisco : Jossey- Bass Publishers.

Mertens, D.M.1998. *Research Methods in Education and Psychology, Integrating diversity with Qualitative or Quantitative Approaches.* London: SAGE Publications.

Mertens, D.M. 2005. *Research Methods in Education and Psychology, Integrating diversity with Qualitative or Quantitative Approaches.* London: SAGE Publications.

Metz, B.; Davidson, O.; Swart, R.; Pan, J. (Eds). 2001. *Climate Change 2001 : Mitigation*. Cambridge : Cambridge University Press.

Middleton, N.; O'Keefe, P.; Moyo, S. 1993. *Tears of the Crocodile, from Rio to Reality in the Developing World.* Nairobi: East African Educational Publishers.

Midgley, J. & Hall, A. 2001. *Social Policy for Development.* London: SAGE Publications.

Milan Areas Schools. (n.d.) [On line] http://milanareaschools.org/~wbenya/biology/notes/ecology%20intro.pdf

Miller, G.R. 1994. *Sustaining the Earth, an Integrated Profile*. California: Wadsworth Publishing Company.

Ministry of Education and Culture. 2009. Invitation to Phase 1: Education for Sustainable Development (ESD) Formal Workshop: Okahandja: National Institute of Education Development.

Ministry of Basic Education, Sport and Culture. 2003. *National Policy on Adult Learning.* Windhoek: Ministry of Education, Sport and Culture.

Ministry of Basic Education and Culture. 1996. *Pilot Curriculum for Formal Basic Education*. Reprint. Okahandja: National Institute for Educational Development/ Ministry of Education and Culture.

Ministry of Basic Education and Culture. 1993. *Towards Education for All*: *A Development Brief for Education, Culture and Training*. Windhoek: Gamsberg Macmillan Publishers.

Ministry of Basic Education and Culture & National Institute of Educational Development. (n.d). *Environmental Education in Namibia*. Unpublished Paper presentation.

Ministry of Environment and Tourism. 2007. *Ministry of Environment and Tourism Strategic Plan 2007/8- 20011/12*. Windhoek: Ministry of Environment and Tourism (MET).

Ministry of Environment and Tourism. 2002. *Namibia's National Assessment Report for the World Summit on Sustainable Development*. Windhoek: UNDP & Government of the Republic of Namibia.

Ministry of Wildlife, Conservation and Tourism. 1992. *NAMIBIA'S GREEN PLAN, (*Environment and Development) Namibia's Green Plan to secure Present and Future Generations of a Safe and Healthy Environment and a Prosperous Economy. Windhoek: MWCT.

Mitra, J. & Hale, M .1993. Environmental Education for Sustainable Development in Bandhu, D.; Bongartz, H.; Ghaznawi, A.B & Gopal, B (Eds). *Environmental Education for Sustainable Development, Proceedings on the Global Forum:* 335-351. New Delhi: Indian Environmental Society.

Moldan, B. 2002. Building the Capacity for Sustainable Development: Maximising International Opportunities in UNESCO. *Educating for a Sustainable Future: Commitments and Partnerships, Proceedings of the High- Level International Conference on Education for Sustainable Development at the World Summit on Sustainable Development*: 205-207. Johannesburg: UNESCO.

Mosidi, S. 2003. A Decade of Education for Sustainable Development, Its Implications for South Africa and Local Government in Particular. *Proceedings of the 21st Century International Conference of the environmental Education Association of Southern Africa: 424-429*. Windhoek: NEEN.

Mouton, J. 1996. *Understanding Social Research.* Pretoria: Van Schaik Publishers.

Moyo, S.; O'keefe, P. & Sill, M. 1993. *The Southern African Environment: Profiles of the SADC Countries*. London: Earthscan Publications Ltd.

Muijs, D. 2004. *Doing Quantitative Research in Education with SPSS.* London: Sage Publications.

Munn, P. & Drever, E. 1990. *Using Questionnaires in Small Scale Research, a Teacher Guide*. Edinburg: The Scottish Council for Research in Education.

Mupetami, L. & Le Roux, L. 1996. An Overview of Environmental Education in Namibia in Tarr, P. (Ed). *Namibia Environment,* Volume 1: 131- 132. Windhoek: Commercial Bank of Namibia.

Murdoch, K. 1994. *Ideas for Environmental Education in the Elementary Classroom*. South Melbourne: Thomas Nelson Australia.

Muyanda-Mutebi, P. (Ed). 2000. *Environmental Education Sourcebook, a Teaching and Training Guide*. Kampala: Pan African Books.

Namib Desert Environmental Education Trust (NaDEET). 2006. *NaDEET's Annual Report* [On line] http://www.nadeet.org/pics/newsletter/NaDEET's%20Annual%20Report%2005-06.pdf

Namibia Environmental Education Network. 2000. *Close Encounters, A series of Namibian EE Case.* Windhoek: NEEN

Namibia Environmental Education Network. 1999. *Draft Environmental Education Policy for Namibia.* Windhoek: NEEN.

Namibia's National Assessment for the World Summit on Sustainable Development. 2002. *Namibia's National Assessment for the World Summit on Sustainable Development*. Windhoek: The Government of the Republic of Namibia & UNDP.

Namibia Vision 2030. 2004. *Policy Framework for Long-term National Development.* Windhoek: Office of the President.

National Association for Environmental Education (n.d.) [On line] http://naaee.org/npeee/learningguidelines/Stapp-ii.html

National Association for Environmental Education (n.d.) [On line] http://naaee.org/npeee/materialsguidelines/chap3.pdf

Neal, P. & Palmer, J. 1994. *The Handbook of Environmental Education.* London & New York: Routledge.

Nigerian Environmental Study/Action Team (NEST). 1991. *Nigeria's Threatened Environment, a National Profile*. Ibadan: NEST.

O'Donoghue, R. 1995. ENVIRONMENTAL EDUCATION: The Development of a Curriculum Through 'grassroots' reconstructive Action. *The South African Journal of Environmental Education*: 10: 16-24.

O'Leary, Z. 2005. *Essential Guide to Doing Research*. London: SAGE.

O'Riordan, T. 1993. The Politics of Sustainability in Turner, K.R. (Ed). *Sustainable Environmental Economics and Management, Principles and Practice*: 37-69. London: Belhaven Press.

Pace, P. 1996. From Belgrade to Bradford - 20 Years of Environmental Education in Filho, W.L.; Murphy, Z. and O'Loan, K. (Eds). *A source book for environmental education, A Practical Review Based on the Belgrade Charter:* 1- 22. London: Parthenon Publishing Group.

Paehlke, E. 1995. (Ed). *Conservation and Environmentalism: An Encyclopaedia*. New York: Garland Publishing INC.

Palmer, J.A. 1992. BLUEPRINTS, Environmental Education, Key Stage 2. Cheltenham: Stanley Thornes (Publisher) LTD.

Palmer, J.A. 1998. *Environmental Education in the 21st Century, Theory, Practice, Progress and Promise*. London and New York: Routledge.

Park.C. 1997. *The Environment, Principles and Applications*. Second edition. London: Routledge.

Pearce, D. 1991. The Global Commons in Pearce, D. (Ed). *Blueprint 2, Greening the World Economy*. London: Earth Scan Publications Limited.

Pearsall, J. & Trumble, B. (Eds). 1995. *The Oxford English Reference Dictionary*. Oxford: Oxford University Press.

Peil, M. 1995. *Social Science Research Methods, a Hand book for Africa.* Nairobi: East African Educational Publishers, LTD.

Pennsylvania Centre for Environmental Education (n.d.) [On line] http://www.pcee.org/EEModules/BWEEssentialsmodule306

Petty, G. 2004. *Teaching Today*. Third edition. Cheltenham: Nelson Thormes Ltd.

Ponniah, W. 1996. The International Environmental Education Programme's Contribution to Worldwide Environmental Education in Filho, W.L.; Murphy, Z & O'Loan, K. (Eds). *A source book for Environmental Education, A Practical Review Based on the Belgrade Charter:* 25- 37. London: Parthenon Publishing Group.

The Presidential Commission of Education, Culture and Training. 2001. *The Presidential Commission of Education, Culture and Training, Towards a Learning Nation*. Windhoek: Gamsberg Macmillan Publisher.

Problem Solving (n.d.) [On line] http://www.depts.ttu/hs/rhim5200/htmfiles/0022.htm

Punch, K.F. 2006. *Developing Effective Research Proposals*. London: Thousands Oaks.

Raven, P.H. & Berg, L.R. 2004. *Environment.* Hoboken: John Willey & Sons INC.

The Regional Information Network (IRN). (n.d.) [On line] (http://www.irinewes.org/report?ReportID=54299&selectregion=EastAfrica,+WestAfrica

Reid, A. 2000. How Does a Geography Teacher Contribute to Pupil's Environmental Education. *Canadian Journal of Environmental Education*: 5: 327.344.

Reid, D.1995. *Sustainable Development, an Introductory Guide*. London: Earth Scan Publications Limited.

Report of a Committee on Environmental Education in Further and Higher Education, appointed by the Department of Education and the Welsh Office. 1994. *Environmental Responsibility, an Agenda for Further and Higher Education*. Cardiff: Training, Enterprise and Education Department.

Robinson, B. & Wolson, E. 1982. *Environmental Education, a Manual for Elementary Educators.* London: Teacher College, Columbia University

Rosnow, R.L. & Rosenthal, R. 1996. *Beginning Behavioral Research, A Conceptual Primer.* Second edition. New Jersey: Prentice Hall.

Rovira, M. 2000. Evaluating Environmental education Programmes: Some Issues and Problems. *Environmental Education Research*, 6(2):143- 155.

Ruskey, A & Wilke, R. 1994. *Promoting Environmental Education: An Action Handbook for Strengthening Environmental Education in your State and Community*. Wisconsin: Wisconsin University-Stevens Point Foundation Press, Inc.

Sauve, L. 1996. Environmental Education and Sustainable Development: A further Appraisal. *Canadian Journal of Environmental Education.* (1): 7-34.

Scheyvens, R.; Nowak, B. & Scheyvens, H. 2003. In Storey, D. & Scheyvens, R (Eds). *Development Field Work, A practical Guide*: 139-166. London: SAGE Publications.

Schulze, S. 1996. Environmental Education for Lecturers. *Educare*: 25 (1&2) 109-119.

Selman, P. 1996. *Local Sustainability. Managing and Planning Ecologically Sound Places*. New York: Marlen's Press.

Shimwooshili Shaimemanya, C.N. 2006. *Teaching Desertification: An Investigation of Teacher and Classroom Attributes, Instructional Strategies, Locus of Control, Attitudes, and Self Efficacy of Namibian Junior Secondary School Teachers.* Unpublished PhD Thesis: Florida Institute of Technology.

Slife, B.D. & Williams, R.N. 1995. *What's Behind the Research. Discovering Hidden Assumptions in Behavioral Sciences*. London : Sage Publications.

Spork, H. 1992. Environmental education: a mismatch between theory and practice. *Australian Journal of environmental education*.8: 147-166.

Stephenson, R. 1996. Environmental Education and the General Public in Harris, G. & Blackwell, C. (Eds). *Environmental Issues in Education*: 157-171. Aldershot: Ashgate Publishing Limited.

The Stockholm Environment Institute (SEI) (n.d.) [On line] http://www.york.ac.uk/inst/sei/sustainability/livelihoods/def.html

Straus, A. & Corbin, J. 1996. *Basics of Qualitative Research, Techniques and Procedures for Developing Grounded Theory.* London: SAGE Publications.

Straus, A. & Corbin, J. 1998. Grounded Theory Methodology: An Overview in Lincolin, Y.S.; Denzin, N.K. (Eds) *Strategies of Qualitative Inquiry*: 158- 183. London: SAGE Publication.

Subramanian, V. 2002. A *Textbook in Environmental Science*. New Delhi: Narosa Publishing House, PVT.LTD.

Sguazzin, T. 1997. Environmental Education, Basic Education, and the BETD towards education for Sustainable Living. *Reform Forum, Journal for Education Reform in Namibia* (5): 32-36.

Switzer, J.V. 2004. *Environmental politics, Domestic and Global Dimensions*. London: Thompson Learning.

Szerszynski, B. 1996. On Knowing What to Do: Environmentalism and Modern Problematic in Lash, S.; Szerszynski, B & Wynne, B. (Eds). *Risk, Environment and Modernity, Towards a New Ecology:* 104- 137. London: Sage publications.

Talbot. L.M.1989. Man's Role in Changing the Global Environment in Botkin,D.B Caswell, M.F.; Estes, J.E. & Orion, A.A. 1989. *Changing the Global Environment, Perspectives on Human Involvement*. Boston: Harcourt Brace Jovanovich, publishers.

Tbilisi Declaration. (n.d.) [On line] http://www.gdrc.org/uem/ee/tbilisi.html

The Theory of Evolution (n.d.) *Evolution* [On line] http://www.conservapedia.com/Evolution

Tredoux, C. and Smith, M. 2006. Evaluating Research Design in Terreblanche, M; Durrheim, K. & Painter, D. (Eds). *Research in Practice, Applied Methods for Social Sciences:* 161- 186. Second edition. Cape Town: University of Cape Town University Press (PTY) LTD.

Tredoux, C. and Smith, M. 2007. Evaluating Research Design in Terreblanche, M; Durrheim, K & Painter, D (Eds). *Research in Practice, Applied Methods for Social Sciences*. 80- 112. Cape Town: University of Cape Town University Press (PTY) LTD.

Tyller-Miller, G. 2002. *Sustaining the Earth: an Integrated Approach.* Toronto: Nelson Thompson Publishing.

United Nations Development Programme (UNDP). (n.d.) [On line] www.undp.un/-un/-namibia/news-hdr-launch.htm

United Nations Environment Programme (UNEP). 2000. *Global Environmental Outlook*. London: Earthscan Publications Ltd.

United Nations Environment Programme (UNEP) (n.d.) [On line] (http://www.grida.no/geo2000/

UNESCO. 1991. *Environmental Education for Our Common Future, A handbook for Teachers in Europe.* Nasjonalgalleriet, Oslo: Norwegian University Press

UNESCO-UNEP. 1988. Environmental Education: *A Process for Pre-service Teacher Training Curriculum Development, A discussion Document for UNESCO Training Seminars on Teacher Training on Environmental Education, Environmental Education Series 26*. UNEP: Division of Science, Technical and Environmental Education.

UNESCO- UNEP. 1977. *Intergovernmental Conference on Environmental Education,* Final Report. Tbilisi: UNESCO-UNEP.

UNESCO. 2002. *Education for Sustainability, From Rio to Johannesburg: Lessons Learnt from a Decade of Commitment*. Johannesburg: UNESCO.

UNESCO. (n.d.) *Education for Sustainable Development* [On line] http://www.unescobkk.org/education/esd/about-esd/good-practice

United Nations Decade of Education for Sustainable Development (n.d.) *SD Feautures* [On line] http://www.gdrc.org/sustdev/un-desd/un-resolution.html

UNFPA (n.d.) [On line] www.unfpa.org/swp/2001/english/ch02.html

United States (U.S.) National Research Council, Policy Division, Board on Sustainable Development, *Our Common Journey: a Transition toward Sustainability* (1999) [On line] http://www.hks.harvard.edu/sustsci/ists/docs/whatisSD_env_kates_0504.pdf

Vogt, W.P. 2007. *Quantitative Research Methods for professionals*. Boston: PEARSON.

Volk, T.L.; Hungerford, H.R. & Winther, A. A. 1993. Environmental Education through Issue Investigation and Problem Solving in Bandhu, D; Bongartz, H.; Ghaznawi, A.G. & Gopal, B. (Eds). *Environmental Education for Sustainable Development, Proceedings on the Global Forum:* 253-277. New Delhi: Indian Environmental Society.

Volk, T.L. 1993. Integration and Curriculum Design in Wilke, R, J. (Ed) *Environmental Education Teacher Resource Handbook, A Practical Guide for K12 Environmental Education*: 46- 73. California: Corwin Press, INC.

Von Weizsäcker, E.U. 1994. *Earth Politics*. London: Zed Books.

Wagger, W.W.; Applefield, J.M.; Earl, R.S. & Dempsey, J.V. 1990. *Learner's Guide to accompany Principles of Instructional Design.* Third edition. Philadelphia: Harcourt Brace Jovanovich College Publishers.

Walsh, M. 2001. *Research Made Real, a Guide for Students*. Cheltenham: Nelson Thornes, LTD.

Wals, A.E.; Beringer, A. & Stapp, W.B. 1989. Education in Action, a Community Problem-Solving Programme for Schools. *Journal of Environmental Education*:13-19.

Walter, K. 1997. Environmental Education and the School Curriculum: The Need for a Coherent Curriculum Theory. *International Research in Geographical and Environmental Education.* 6(3) 252-255.

Wells, D.T. 1996. *Environmental Policy, a Global Perspective for the Twenty First Century*. New Jersey: Prentice Hall, INC.

Willers, V. & van Staden. F. 1998. Environmental Concern and Environmentally Responsible Behaviour: Towards a Model. *South African Journal of Environmental Education*.18: 29-46.

Wiles, J. & Bondi, J. 1993. *Curriculum Development, a Guide to Practice.* New Jersey: MERRIL an Imprint of Prentice Hall.

World Summit on Sustainable Development on (n.d.) [On line] (http://www.wssd-education.org.uk/jo-text.htm#jo1

World Wide Fund for Nature (n.d.) Forest Conservation through the Decades [On line] http://www.panda.org/about_our_earth/about_forests/timeline_forest_conservation/

Annexure I: Letter to Ministry of Education and Culture

P.O. Box 25833
Windhoek
Namibia
16 June 2008

The Permanent Secretary
Ministry of Education and Culture
Private Bag 13186
Windhoek

Dear Sir/ Madam

Re: Permission to carry out a survey for doctoral degree studies in the Namibian Colleges of Education

I am a Lecturer at the University of Namibia (UNAM) who is currently enrolled for a doctoral degree at the University of South Africa (UNISA). The title of my study is: The Incorporation of Environmental Education for Sustainability in the Namibian Colleges of Education.

As part of my studies, I have to conduct a survey in the four Colleges of Education in Namibia. I am therefore requesting your permission to enter these colleges and carry out the survey through the use of a questionnaire. I promise to cause minimal disturbance during that process.

Yours faith fully

Alex Kanyimba
Tel 206 3886; Mobile 0812054339

Cc: Prof.I.A.Coetzer
UNISA's Department of Educational Studies
PO Box 392; Pretoria, 0003, Tel: 27 12 429 4506

Annexure II: Response from Ministry of Education and culture

REPUBLIC OF NAMIBIA

MINISTRY OF EDUCATION

DIRECTORATE: HIGHER EDUCATION

INTERNAL MEMO/SUBMISSION

MINISTRY OF EDUCATION
DIRECTORATE OF HIGHER EDUCATION
24 JUL 2008
PRIVATE BAG 13186, WINDHOEK, NAMIBIA

Date: 24 July 2008

TO: All Rectors: Colleges of Education

FROM: Director: Higher Education

PERMISSION TO CARRY OUT A RESEARCH FOR STUDY PURPOSE: MR. A.E. KANYIMBA.

Mr Kanyimba is a staff member at the University of Namibia (UNAM). He wishes to conduct a research for study purposes at your institutions. The Ministry encourages such researches for academic and professional studies and advancement and would like therefore recommend that you grant him permission to carry out his research at your Colleges of Education.

Thank you.

All official correspondence must be addressed to the Permanent Secretary

Annexure III: Questionnaire

RESEARCH QUESTIONNAIRE: THE INCORPORATION OF ENVIRONMENTAL EDUCATION FOR SUSTAINABILITY IN THE NAMIBIAN COLLEGES OF EDUCATION

INTRODUCTION: The researcher is a Doctoral student at UNISA who is currently conducting an investigation in the field of environmental education. The topic of study is: The Incorporation of Environmental Education (EE) for Sustainability in the Namibian Colleges of Education. You are asked to honestly respond to the following questions. The information collected will form part of the doctoral research project. All of the information you give will be kept confidential. Your name and particulars will not be disclosed to any one. The completion of the questionnaire could take at least 30 minutes.

PART 1: DEMOGRAPHIC INFORMATION

QUESTION 1: Which institution are you working for? **(CIRCLE ONLY ONE ANSWER)**

Windhoek College of Education	1
Caprivi College of Education	2
Ongwediva College of Education	3
Rundu College of Education	4
Other (Please specify)	5

QUESTION 2. What is the department in which you are working? **(CIRCLE ONLY ONE ANSWER)**

Department of Mathematics and Integrated Natural Sciences	1
Department of Language and Social Sciences	2
Department of Pre-vocational Studies and Agriculture	3
Department of Lower Primary Education	4
Department of Education Theory and Practice	5
Other (please specify)	6

QUESTION 3: What subject/s do you teach at this College?

	1
	2

PART 2: THE INCORPORATION OF EE CURRICULUM GOALS IN THE NAMIBIAN COLLEGES OF EDUCATION

QUESTION 4. For questions 4.1 - 4.4 please indicate whether the subject/s that you teach at the college incorporate/s the following goal statements of environmental education (EE). (CIRCLE ONLY ONE ANSWER)

Use the following scale:

Slightly 1	Not at all 2	Fairly well 3

4.1 ECOLOGICAL FOUNDATION (CIRCLE ONLY ONE ANSWER PER GOAL STATEMENT)

Individual and populations: the nature/ behavior of population such as birth, growth, change and its effect, death, extinction	1	2	3
Interactions and interdependence: natural communities in terms of structure, behavior interaction of individuals in a particular place like forests, deserts, seas, ponds as well as examining the food chain, food web and predation	1	2	3
Ecosystem: structure, interaction and effects between living and non-living environment such as interdependence and competition. How organisms deal with change in natural environment such conforming, regulating, dormancy and migrating.	1	2	3
Succession: Primary succession: process that takes place when the weathering of rocks leads to soil formation and the introduction of pioneer plants and animal species. Secondary succession: all processes that take place when an abandoned land is returned to an original climax community through the growth of successional plants and the re-emergence of organisms grow in the areas that were disturbed by humans	1	2	3
Energy and chemical cycles: How energy through the primary and secondary producers and decomposers and chemical cycles such as water cycle, oxygen cycle, nitrogen cycle, and phosphorous cycle pass through the natural sytem	1	2	3
Man as a component of the natural systems: The effects of human behaviors such as the development of technology and the effects of people's attitudes and values on natural systems	1	2	3
Homeostasis is the balance of nature in the geosphere, hydrosphere, biosphere, atmosphere and noosphere	1	2	3

4.2. CONCEPTUAL AWARENESS: ISSUES AND VALUES (CIRCLE ONLY ONE ANSWER PER GOAL STATEMENT)

Sustainability and sustainable development. Goals of sustainable development such as economic, social and environmental and values of sustainable living such as interdependence, bio-diversity, interspecies equity, intergenerational equity, participation, human needs and human rights	1	2	3
Identification of the differences between an environmental problem, an environmental issue and an environmental crisis	1	2	3
Communicates how people's cultural activities such as politics, religion, society affect the environment	1	2	3
Communicates how individual people and people in groups affect the environment	1	2	3
Students identify and clarfy their values and attitudes toward an issue or the environment	1	2	3
Communicates that there may be more than one way to resolve an environmental issue or crisis	1	2	3
Communicates that the difficulty in resolving environmental issues/crises is caused by different attitudes and values that people involved in them have	1	2	3

4.3 INVESTIGATION AND EVALUATION (CIRCLE ONLY ONE ANSWER PER GOAL STATEMENT**)**

Problem solving skills to identify specific environmental problems, issues and crises: Skills include recognizing the problem, defining the problem, collecting information and developing a plan of action for environmental problems	1	2	3
Identification of actors and stakeholders involved in an environmental issue	1	2	3
Identification of beliefs and values that explain people's position on environmental issues and crises	1	2	3
Identification of the ecological costs and benefits of designated solutions to the environmental problems, issues and crises	1	2	3
Examination of a variety of issues and crises such as clean water, protecting forests and preserving and the environment clean with all the different solutions that are needed to solve those issues	1	2	3
Identification of the human costs and benefits of designated environmental problems, issues and crises	1	2	3

4.4 ENVIRONMENTAL ACTION (CIRCLE ONLY ONE ANSWER PER GOAL STATEMENT)

Communicating the need for responsible citizenship action to resolve environmental problems, issues and crises	1	2	3
Communicating the various levels of environmental action such as individuals, groups and organization level	1	2	3
Identification of environmental action categories such as persuasion, consumerism, political action, legal action, eco-management	1	2	3
Examination of scenarios and case studies that would allow the learner to apply the knowledge of environmental action and to choose responsible environmental action	1	2	3
Identification of the human and ecological costs and benefits of identified environmental action	1	2	3
Individual student or a group of students take action on an environmental problem that they have identified and analyzed	1	2	3

PART 3: TEACHER EDUCATORS' UNDERSTANDING, AWARENESS, AND INTERPRETATION OF CROSS-CURRICULAR TEACHING AS A MODEL FOR INCORPORATING EE FOR SUSTAINABILITY IN THE NAMIBIAN COLLEGES OF EDUCATION

QUESTION 5. Are you informed of the need to incorporate (teach) environmental education for sustainability as a cross-curricular theme? **(CIRCLE ONLY ONE ANSWER**

Informed	1
Uninformed	2
Slightly informed	3

QUESTION 6. Where do you get information regarding the incorporation (teaching) of EE for sustainability as a cross-curricular theme?

Friends and colleagues	1
Ministry of Education & Culture	2
Seminar & workshops	3
Never heard of Environmental Education as a cross- curricular theme	4
Other (Specify)	5

QUESTION 7. Which of the following definitions of cross curricular teaching characterise your own understanding of this concept (cross- curricular teaching?)

Cross-curricular teaching is a process whereby teachers of science or Environmental Education develop and implement a programme in their department that coordinates with the other programmes throughout the school.	1
Cross-curricular teaching is a process by which a group of educators collaborate to identify, teach and assess an Environmental Education concept through the eyes of their subjects	2
Cross-curricular teaching is process by which students are made to explore what they are learning, write about what they are learning and interact with their classmates in various grades	3

QUESTION 8. How important is the incorporation (teaching) of environmental education as a cross-curricular theme at your college? **(CIRCLE ONLY ONE ANSWER)**

Very important	1
Important	2
Unimportant	3

PART 4: REASONS FOR NOT INCORPORATING EE FOR SUSTAINABILITY AS A CROSS-CURRICULAR THEME IN THE NAMIBIAN COLLEGES OF EDUCATION

QUESTION 9. If you do not incorporate (teach) environmental education for sustainability as a cross-curricular theme at the college, what are the reasons for not teaching (incorporating) environmental education for sustainability in the subject that you teach at the college **(CIRCLE ONLY ONE ANSWER)**

Environmental Education as a cross-curricular theme is not on the college timetable	1
I do not have knowledge to teach Environmental Education as a cross-curricular theme	2
What I teach is not relevant to Environmental Education	3
I am not interested in teaching Environmental Education as a cross-curricular theme	4
Other (specify)	5

QUESTION 10. Which of the following situations or conditions would enhance the incorporation (teaching) of environmental education for sustainability in the subject that you teach at your college **(CIRCLE ONLY ONE ANSWER)**

Provision of In-service training about how to incorporate environmental education for sustainability as a cross-curricular theme	1
Provision of more support from the Ministry of Education	2
Create space for environmental education on the Timetable	3
Better access to resources about the cross-curricular teaching of environmental education for sustainability	4
Other (Specify)	5

PART 5: FINAL COMMENTS

QUESTION 11. Any other comments or suggestions regarding the incorporation of environmental education for sustainability in the Namibian Colleges of Education

_____
_____
_____
_____
_____
_____

THIS IS THE END OF THIS QUESTIONNAIRE (CLOSED ENDED QUESTIONS) THANK YOU FOR YOUR TIME AND COOPERATION!!!

Annexure IV: Raw SPSS Data

1. Name of Institution you are working for

	Count	Col %
Windhoek College of Education	20	31.3
Caprivi College of Education	16	25.0
Ongwediva College of Education	15	23.4
Rundu College of Education	13	20.3
Total	64	100.0

2. Department in which you are working

Departments	Count	Col %
Department of Mathematics and Integrated Natural Sciences	9	14.3
Department of Languages and Social Sciences	21	33.3
Department of Pre-vocational Studies and Agriculture	7	9.5
Department of Lower Primary Education	9	14.3
Department of Education Theory and Practice	9	14.3
Department of Intergrated Media and Technology	8	13.0
Total	63	100.0

Subjects	Teacher educators	Col R %
Social Science Education	6	7.1
Arts and Culture Education	3	3.6
English	14	16.7
Education theory and practice	15	17.9
Other Languages	5	6.0
Mathematics	3	3.6
Intergrated Natural Science	9	10.7
Lower primary Education	8	9.5
Agricultural Science	3	3.6
Integrated Media and Technology of Education	13	15.5
Accounting	1	1.2
Needlework	1	1.2
Geography	1	1.2
History	2	2.4
Total	84	100.0

4. Ecological foundation

Sub goals		Count	Col %
Individual and populations	Slightly	23	37.1
	Not at all	19	30.6
	Fairly well	20	32.3
Total		62	100.0
Interactions and interdependence	Slightly	17	28.3
	Not at all	28	46.7
	Fairly well	15	25.0
Total		60	100.0
Ecosystems: structure, interaction and effects between living and non-living organisms	Slightly	19	31.1
	Not at all	27	44.3
	Fairly well	15	24.6
Total		61	100.0
Succession	Slightly	12	19.7
	Not at all	41	67.2
	Fairly well	8	13.1
Total		61	100.0
Energy and chemical cycles	Slightly	14	23.0
	Not at all	36	59.0
	Fairly well	11	18.0
Total		61	100.0
Man as a component of the natural systems	Slightly	19	31.7
	Not at all	17	28.3
	Fairly well	24	40.0
Total		60	100.0
Homeostasis	Slightly	17	28.3
	Notat all	35	58.3
	Fairly well	8	13.3
Total		60	100.0

5. Conceptual Awareness

Sub goals		Count	Col %
The sustainability and sustainable development	Slightly	19	30.6
	Not at all	22	35.5
	Fairly well	21	33.9
Total		62	100.0
Identification of the differences between an environmental problem, an environmental issue and an environmental crisis	Slightly	28	45.2
	Not at all	27	43.5
	Fairly well	7	11.3
Total		62	100.0
Communicates how people's cultural activities such as politics, religion, and social activities affect the environment	Slightly	24	38.1
	Not at all	16	25.4
	Fairly well	23	36.5
Total		63	100.0
Communicates how individual people and people in groups affect the environment	Slightly	25	40.3
	Not at all	14	22.6
	Fairly well	23	37.1
Total		62	100.0
Students identify and clarify their values and attitudes toward an issue or the environment	Slightly	24	38.1
	Not at all	16	25.4
	Fairly well	23	36.5
Total		63	100.0
Communicates that there may be more than one way to resolve an environmental issue or crisis	Slightly	24	38.7
	Not at all	22	35.5
	Fairly well	16	25.8
Total		62	100.0
Communicates that the difficulty in solving environmental issues and crises is created by different attitudes and values that people involved in them have	Slightly	27	44.3
	Not at all	17	27.9
	Fairly well	17	27.9
Total		61	100.0

6. Investigation and evaluation level

Sub goals		Count	Col %
Problem solving skills to identify specific environmental problems, issues and crisis	Slightly	20	31.7
	Not at all	31	49.2
	Fairly well	12	19.0
Total		63	100.0
Identification of actors and stakeholders involved in an environmental issue and crisis	Slightly	21	33.3
	Not at all	34	54.0
	Fairly well	8	12.7
Total		63	100.0
Identification of beliefs and values that explain people's position on an environmental issue and crises	Slightly	22	34.9
	Not at all	30	47.6
	Fairly well	11	17.5
Total		63	100.0
Identification of ecological costs and benefits of designated solutions to the environmental problems, issues and crises	Slightly	18	28.6
	Not at all	37	58.7
	Fairly well	8	12.7
Total		63	100.0
Examination of a variety of issues and crises	Slightly	19	30.2
	Not at all	29	46.0
	Fairly well	15	23.8
Total		63	100.0
Identification of the human costs and benefits of designated environmental problems, issues and crises	Slightly	20	31.7
	Not at all	35	55.6
	Fairly well	8	12.7
Total		63	100.0

7. Environmental Action Level

Sub go0als		Count	Col %
Communicating the need for responsible citizenship action to resolve environmental issues and crises	Slightly	22	35.5
	Not at all	21	33.9
	Fairly well	19	30.6
Total		62	100.0
Communicating the various levels of environmental action.	Slightly	16	25.8
	Not at all	36	58.1
	Fairly well	10	16.1
Total		62	100.0
Identification of environmental action categories	Slightly	12	19.7
	Not at all	41	67.2
	Fairly well	8	13.1
Total		61	100.0
Examination of scenarios and case studies	Slightly	23	37.1
	Not at all	34	54.8
	Fairly well	5	8.1
Total		62	100.0
Identification of the human and ecological costs and benefits of identified environmental action	Slightly	20	32.3
	Not at all	36	58.1
	Fairly well	6	9.7
Total		62	100.0
Individual or a group of students take action on an environmental problem that they have identified and analyzed	Slightly	19	30.6
	Not at all	37	59.7
	Fairly well	6	9.7
Total		62	100.0

8. Informed about the need to incorporate EE

Category	Count	Col %
Informed	37	59.7
Uninformed	6	9.7
Slightly informed	19	30.6
Total	62	100.0

9. Where do you get information regarding the incorporation of EE

Sources	Count	Col %
Friends and colleagues	7	11.5
Ministry of Education and Culture (MEC)	23	37.7
Seminars and workshops	18	29.5
Never heard of EE	6	9.8
Internet	2	3.3
EE projects	1	1.6
Print media	1	1.6
Studies	1	1.6
School syllabus	2	3.3
Total	61	100.0

10. Definitions of cross-curricular

Definition proposed	Count	Col %
Cross curricular teaching is a process whereby teachers of science and Environmental Education develop and implement a programme in their department	15	24.6
Cross curricular teaching is a process by which a group of educators collaborate to identify, teach and assess an Environmental Education concept	35	57.4
Cross curricular teaching process by which a students are made to explore what they are learning, write about what they are learning and interact with their classmates in various grades	10	16.4
None of the above	1	1.6
Total	61	100.0

11. Importance of incorporating EE

Category	Count	Col %
Very important	33	51.6
Important	24	37.5
Unimportant	7	10.9
Total	64	100.0

12. Reasons for not teaching EE in subject that you teach

Reasons	Count	Col %
EE as a cross -curricular theme is not on the college timetable	20	46.9
I do not have knowledge to teach EE as a cross-curricular theme	4	8.2
What I teach is not relevant to EE	7	14.3
I am not interested in teaching EE as a cross-curricular theme	1	2.0
Only a few educators teach EE	1	2.0
EE is incorporated in the Second Language Education (SLE) syllabus	2	4.1
We teach it in sciences only	1	2.0
Lack of resources	1	2.0
Incorporating EE is time consuming and curriculum is overloaded	1	2.0
EE is not incorporated in my subject syllabus	5	10.2
No clear guidelines for EE teaching	1	2.0
Lack of interdepartmental planning	1	2.0
No specific reason	1	2.0
Total	46	100.0

13. Situation that would enhance the incorporation of EE

Situations	Count	Col %
Provision of In-service training on about how to incorporate EE	25	40.3
Provision of more support from the Ministry of Education	7	11.3
Create space for EE on the timetable	9	16.1
Better access to resources	14	22.6
Emphaseze EE in the curriculum/ syllabus	2	3.2
Include EE as theme in syllabus	1	1.6
College should be required to provide proof of cross-curricular themes	1	1.6
Availability of material and resources in Namibian Languages regarding EE	1	1.6
This is not possible at college level	1	1.6
It should be intergrated in the curriculum of science subjects	1	1.6
Total	61	100.0

14. Final comments regarding EE

Response category	Count	Col %
Teacher educators need training and materials about EE	14	34.1
EE should be incorporated in all subjects because it provides knowledge that could save the world	10	24.4
EE should be placed in the syllabus, calendar and calendar	7	17.1
Namibia has done very little to promote EE in the schools	4	9.8
Incorporation of EE is possible in some grades and subject areas	3	7.3
Enough is being done to promote EE in the educational system	2	4.9
Learners need to make field visits to environmentally threatened areas	1	2.4
Total	41	100.0

Annexure V: Responses to open ended question

Participants' final comments regarding the incorporation of environmental education for sustainability in Namibian Colleges of Education.

PART 5: QUESTION 11. Any other comments or suggestions regarding the incorporation of environmental education for sustainability in the Namibian Colleges of Education

Note: Some of the participants did not respond to this question.

Teacher educator # 1: Caprivi College of Education

In the Namibian subject syllabi most include a lot of cross-curricula issues of which environmental education is part. In language teaching the incorporation of EE forms the base in communicative language practice. Students are given real issues that affect them both at college and in their communities to analyze and talk about. Although curriculum in the Namibian Colleges of Education includes EE as one of the cross curricula theme, the onus remains that of the teacher educator to deal with it deeply or slightly. EE is very much incorporated in natural sciences and health education at primary school level; also at secondary school level the subject is covered in many subjects like Agriculture, Life science, Geography, etc. I want to believe enough is being done in those subjects to promote awareness of EE.

Teacher educator # 2: Caprivi College of Education

This will equip the future teacher with knowledge which he/she can use to save the forests which are currently being destroyed but they protect the earth from erosion e.g water, wind in the SADC Countries or Namibia. He will then disseminate the information to his learners who will start building a sense of responsibility to safeguard the earth.

The unnecessary creation of CO2 which produces global warming will be understood and disseminated to beneficiaries who will stop to produce CO2 unnecessarily. The consequence of using phathogens which depletes the ozone layer is understood by student teachers who will transmit knowledge to pupils who are involved in buying products containing the chemicals.

Teacher educator # 3: Caprivi College of Education

This topic should be taught in order for students to know how to care and sustain the environment around them. This will also help them to deliver the message to the learners they will teach. If Namibia's environmental resources are well sustained and cared for, then our country will remain a natural resource-rich country, e.g. if we care for our own water well, we will continue to enjoy fresh fish which is good for our health.

Teacher educator # 4: Caprivi College of Education

Designing teaching materials/aids like charts, flash cards etc. are very expensive. Lack of paint, marker pens, posters etc. have a negative influence on creating such materials. They make student teachers aware of the importance of using teaching aids during lessons and therefore to create a 'print rich' classroom environment for better EE teaching. The teacher educators may implement methods of designing a variety of teaching aids because pupils/ people learn best when they can see as they learn. Visuals support provides sensory stimulation which is necessary for growth. Designing media (paints, marker pens, posters, etc) should be accessible to teacher educators and students.

Teacher educator # 5: Caprivi College of Education

For the nation to be pro-active to catastrophic situations like volcanoes, storms, etc they need to understand their environment through formal teaching. In a way, people will know which plants to plant where, when and why. Knowledge of the environment in which one lives will enhance productivity, innovation, creativity and assertiveness**.**

Teacher educator # 6: Caprivi College of Education

The integration of environmental education in the college curriculum remains a great challenge. This kind of challenge calls for exclusive commitment and professional skills on how to address the challenge. Teacher educators need relevant literature that can be used in the integration of EE across the curriculum.

Teacher educator # 7: Caprivi College of Education

This can be a very good activity because it can help students to relate what they learn to the environment around them. Sustainability of the resources will be extended to each and every students or citizen at large.

Teacher educator # 8: Caprivi College of Education

The teachers to be or trainees need knowledge in all areas of learning, It is therefore very important to incorporate environmental education. Student teachers are human beings and they will be working or interacting with the human beings (learners) after the completion of their programme. It is therefore very crucial that they have the knowledge about the interdependence of living organisms.

Teacher educator # 9: Caprivi College of Education

Before EE is incorporated curricula experts need to review the current curricula and see how best EE can be incorporated. This must be followed by a sustained program of workshops and seminars in order to prepare the teacher educators on how they can teach and assess EE across the board.

Teacher educator # 10: Caprivi College of Education

Environmental education to me is important and man plays a greater role in sustaining it. Therefore man can only know what is required of them through incorporating it through into the teaching/ learning situation that can help getting our tomorrow informed. Therefore, I would like it to be incoporated and materials that give indebt information on the issue must be provided. Let it be one of the cross- curricular issues in colleges and school syllabi.

Teacher educator # 11: Caprivi College of Education

Although environmental education could be a subject on its own, I strongly feel that it must be incorporated in the following subjects; Social Sciences, Agriculture, Life Science and Natural Sciences. Syllabis for these subjects must be revisited once again and incorporate EE topics. The syllabis for these subjects must clearly indicate how EE topics must be assessed both formatively and summatively so as to prevent teacher educators from not taking EE seriously. If it (EE) is to be assessed surely teacher educators will consider it seriously just like any other theme or topic.

For a thorough and successful incorporation of EE in Colleges of education, the Ministry of Education must ensure that the teacher educators who are teaching subjects must have a Namibian environmental education certificate offered by the Polytechnic of Namibia. It is also very important that the ministry through NIED organizes workshops on how to incorporate, teach and assess EE in the Namibian Colleges of education.

Teacher educator # 12: Caprivi College of Education

The incorporation of environmental education in my subject is a policy issue and should not be compromised when I am teaching. The problem is that if I incorporate EE in my subject, it is sometimes difficult for student teachers to know that I have incorporated EE in Arts; For example, student teachers acted out a puppet show about a person who went to hunt for honey and in the process started a big fire that destroyed the grazing land of animals. So I do not know whether the application of students of EE to this puppet show was very clear.

Teacher educator # 13: Caprivi College of Education

Incorporation of environmental education for sustainability in the Namibian Colleges of Education can only be a reality if sensitization and information sharing and workshops are conducted in colleges as well as making it a compulsory cross-curricular theme in relevant subjects at specified year level.

Teacher educators # 14: Ongwediva College of Education

I deem it important to incorporate environmental education for sustainability in the Namibian Colleges of education. The reason being that the colleges train teachers who will teach the basic education (primary and secondary). Once they understand the importance of environment education, then they will pass these on to the young generations.

It is very important that we conserve, save our natural resources and use our environment/ resources in a sustainable way so that the future generataion will use the same resources we are using.

Teacher educators # 15: Ongwediva College of Education

Teaching environmental education is important not only to learners but to the community as well.

- The curriculum should be integrated to all types of subjects
- The ministry must support the schools so that EE was implemented already
- Peoples should be educated and learn the importance of it
- Immediate implementation should take place

Teacher educators # 16: Ongwediva College of Education

More emphasis on EE is vital and collaboration must be made by continuously linking up all stakeholders to sensitize all role players including curriculum planners on the importance of EE as a cross-curricular issue.

Teacher educators # 17: Ongwediva College of Education

Would like to see more integration of EE topics into the curriculum to create more understanding and awareness as all human activities on the earth are depending on the environment. Empowering teachers with information will bring about change in attitudes and practices in our community. I would like to see more support coming from the Ministry of Education and other institutions dealing with environmental education issues. Our education system cannot afford to treat EE with little significance at a stage when climate change and impact on environment are making headlines worldwide and affect our daily lives.

Teacher educators # 18: Ongwediva College of Education

Environmental education should be integrated within the syllabus of the subjects in which it be incorporated, otherwise it will be a matter of “out of side” and “out of mind”. I am simply saying incorporation might not work. It will need more than training on specific positions within the syllabus and more coming together.

Teacher educators # 19: Ongwediva College of Education

The main problems whey “EE “is not incorporated in the teaching of English language education and English communication is because the topic or theme are not included in the syllabus. When planning for teaching we base our plans on the syllabus and it is easy to completely forget about the teaching of a theme which does form part of the syllabus.

Teacher educators # 20: Ongwediva College of Education

EE should be incorporated in the curriculum. But teacher educators need to be trained.

Teacher educators #21: Ongwediva College of Education

Currently curriculum is already overloaded. EE must be incorporated in subjects such as Agriculture, Biology, Life sciences etc.

Teacher educators # 22: Ongwediva College of Education

Is this part of the existing school curriculum? My subject area is Lower Primary. We teach a little everything, but not in the way it is explained in this questionnaire. There are too many things to be implemented, where would the teachers find the time, I don’t know. Curriculum is vey overloaded! We need to find a balance.

Teacher educators # 23: Ongwediva College of Education

I believe EE to be an important subject/ subject but the three year diploma programme does not permit ample time for subjects already in the curriculum. To add something more just means having to reduce time on other more essential subjects in child development, teaching, reading, etc
Solution

- Four year degree programme

Teacher educators # 24: Ongwediva College of Education

I am suggesting that the curriculum panel member’s needs to make a clear view on environmental education (EE) and environmental learning (EL). May be the incorporation of environmental learning must be based on the level of student

Teacher educators # 25: Rundu College of Education

It is very important to incorporate EE, because teacher educators and students who are not in the science department will learn more and have knowledge about EE.

Teacher educators # 26: Rundu College of Education

Namibia as a country has done very little in promoting EE in schools in order to be on par with the United Nations Education for Sustainable Development (UNDESD 2004-2014). In my view, Namibia will give very little information based on what has been done in the integration of EE as well as mitigating global warming in general. If ever events are happening then it is only happening in pockets of areas within the country without a national approach to promote EE activities within the schools and colleges. Attempts were made by the support environmental education (SEEN) from 2001-2005 without any extension of the programmes for national purposes.

Teacher educators # 27: Rundu College of Education

It is very important that the subject be included on the timetable. However, considering the changing world, it is therefore important to consider providing more seminars from the environmental department and the Ministry of Education. EE is a crucial subject espicialy in the Namibian Education sustem. I suggest that in future when we have qualified staff, proper qualification and resources, it should be taught as a subject in all phases, even though it is offered in some phases (e.g. senior phases). It is a good idea to incorporate it in our subjects, but would rather see it part of the curriculum in the Namibian Colleges of Education, so that studentsteachers can be trained to teach it in schools but only at college level but it must be included up to university level. Wishing you all the best for your studies.

Teacher educators# 28: Rundu College of Education

EE is a cross-curricular issue in the curriculum of the Lower Primary pphase. We make use of thematic teaching which makes it even easier to teach it. It is also a topic in environmental studies subject. Thanks

Teacher educator # 29: Rundu College of Education

In lower primary, we are using thematic teaching. Environmental study is the umbrella of all subjects. The topic could be integrated into other subjects.

Teacher educator #30: Rundu College of Education

EE should be made a cross curricular subject like any other subject within the college and the Ministry of Education must see to it that it receives proper attention.

Teacher educator #: 31 Rundu College of Education

It seems to be an interesting subject but we need to have a backup system. The schools should start offering and spill over to colleges otherwise it would be a valuable subject to have. There has been some workshops given, but they did not seem to ring any bell to start offering or incorporate EE.

Teacher educators # 32: Rundu College of Education

Environmental education is a vital aspect in everyone's life; therefore all necessary stakeholders should be involved to make sure of its success. Other than that most /some of the questions in this paper were quite confusing. One wonders what slightly informed mean as compared to informed etc.

Teacher educator# 33 Rundu College of Education
Syllabuses should explicitly stipulate areas of EE to make it easier for teacher of lecturers to incorporate them in their teaching.

Teacher Educator # 34: Windhoek College of Education

The colleges are offering social studies like courses e.g. Geography. As an Education Theory Practice lecturer (ETP) I am not aware whether it is incorporated in the teaching but it I think that it should be. Then I need to be helped on how to incorporate EE in ETP subjects that currently we are not doing.

Teacher Educator # 35: Windhoek College of Education

A very good and important issue to be addressed. Improve lack of printed material in Namibia Languages for all grades (1-7) (8-13).

Teacher Educator # 36: Windhoek College of Education

I am aware that EE is one of the cross- curricular themes as we have environmental topics in the English textbooks and curriculum or syllabus but I feel that somehow we need to be constantly reminded of it in some way. In-service training would be a good idea. It should not just be taught as a subject but it must rather be authentic. Examples of the effects of environmental education on the economy should be made known to people.

Teacher Educator # 37: Windhoek College of Education

In the colleges the teaching of EE is taking place, but more in social studies and natural sciences. In ETP it is done but not as much as the cross-curricular theme HIV/AIDS.

Teacher Educator # 38: Windhoek College of Education

The integration in language is the integration of different skills such as reading, speaking, writing, and listening
It is also the integration of different components e.g. literature and language use. Only in grades 1-4 is such integration applicable.

Teacher Educator # 39: Windhoek College of Education

Environmental education should definitely get more attention in the curriculum as it is a worldwide issue and teachers are the ones who reach many children through the teaching. The information could be spread and thus communities at the grassroots level could assists in saving planet. May be placing activities on our annual calendar would be a good idea as well.

Teacher Educator # 40: Windhoek College of Education

Home ecology is the study of the interaction between humans and their environment and how humans manage their resources. The aim of this subject is to enable learners to ultimately achieve a desirable quality of life for themselves, their families and their community and future generations**.**

Teacher Educator # 41: Windhoek College of Education

Field trips with students to areas where the environment is threatened by human intervention will make it more of a reality to them. Analyzing the situation and writing possible solutions in a thesis form might help their future conclusions regarding this phenomenon. They will have practical experience which they can use in the schools where they will teach.