PERCEPTIONS OF TEACHERS AND LEARNERS TOWARDS THE INTEGRATION OF ENVIRONMENTAL EDUCATION IN THE CLASSROOM

BY

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DECLARATION

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I, ***Nonkanyiso Pamella Shabalala***, hereby declare that this dissertation– which is submitted to the University of South Africa for a Master's degree in Education has not been submitted by me for any other degree at this or any other university. I further declare that this study is my own work, and that all the sources that I have quoted have been indicated and acknowledged by means of complete references.

Signature

December 2019
Date

DEDICATION

Psalm 145: 9, “The Lord is good to all; he has compassion on all he has made”. First of all, I would like to dedicate this study to the Almighty God who has carried me through with his mercy, without the grace of God I would not be here today.

- A person who is dear to my heart, my late father Thembinkosi Robert Shabalala, great warriors fall but their works are never forgotten, you may be gone but you will forever remain in my heart because you have laid the foundation in my life.
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ABSTRACT

Environmental Education (EE) has been integrated into the school curriculum for many years. According to this study, integration has to be followed by implementation, therefore the process of implementation is successful when integration has been successfully carried out. This study aimed to understand how teachers meet the curriculum needs of learners in order to implement effective teaching and learning of EE and for learners to gain adequate knowledge of EE. The methodology employed by this study was a qualitative research method and a multiple case study design. The theories employed to guide this study were social learning theory and social constructivism theory. This study employed a purposive sampling technique and three secondary schools were sampled for observations, three Natural Science (NS) teachers in grade 8 classes were sampled for interviews and 24 learners were sampled for focus groups in grade 8 NS classes. The findings of this study reveal that there is a lack of knowledge regarding caring for the environment, of which there is a contradiction between EE guidelines and policies provided by the Department of Education (DoE) and the teaching practices of teachers. Although education is perceived to be an essential tool in the conservation of nature through the development of information, aptitudes, qualities and critical thinking by the general population, it does not seem to have a large impact. In this study the aim was to understand how learners and teachers perceive the environment. This study implicates that there is an important role for other stakeholder's involvement. Thus far, it was recommended by this study for EE curriculum to be revisited and emphasises the importance of thorough teacher training in regards to the integration. The purpose of this study was to explore how teachers and learners in three selected secondary schools in the UGU education district perceive the integration of EE in classrooms.

Keywords: *Environment, Environmental Education, Curriculum Assessment Policy Statement (CAPS) and Education for Sustainable Development (ESD).*

I- ABSTRACT

I- Environmental Education (EE) ihlanganiswe nekharikhulamu yesikole eminyakeni edlule. Ngokwalolu cwaningo, ukuhlanganiswa kumele kulandelwe ngokusetshenziswa, ngakho- ke, inqubo yokusebenzisa iyaphumelela lapho kuhlanganiswa kwenziwa ngempumelelo. Lolu cwaningo luhlose ukuqonda ukuthi othisha bahlangabezana kanjani nezidingo zekharikhulamu zabafundi ukuze babe nokufundisa nokufunda okusebenzayo kwe-EE nokuthi umfundi athole ulwazi olwanele lwe-EE. Indlela esetshenziswe yilolu cwaningo yayiyindlela yokucwaninga eyejwayelekile, ukwakhiwa kwamacala amaningi okufundwa Kanye nemibono esetshenziselwe ukuqondisa lolu cwaningo kwakuyithiyori yokufunda ukuqondisa lolu cwaningo kwakuyithiyori yokufunda ngokuhlalisana komqondo kanye nomqondo wokuqina kwezenhlalo. Lolu cwaningo lusebenzise inqubo yokuhlampula enenhloso kwathi izikole ezintathu zenziwa amasampula ukuze kubhekwe zona, othisha abathathu be- Natural Science (NS) emabangeni e- 8 bavunyelwa ukuxoxisana nomcwaningi kwathi abafundi abangama- 24 batholakaliselwa ukugxila emakilasini e-NS ebangeni le- 8. Ukutholwa kwalolu cwaningo kuveze ukuthi kunokuntuleka kolwazi mayelana nokunakekela imvelo okukhona kuyo ukungqubuzana phakathi kwemihlahlandlela ye-EE nezinqubomgomo ezinikezwe nguMnyango Wezemfundo (DoE) nemikhuba yokufundisa yabothisha. Yize imfundo ibonwa njengethuluzi elibalulekile kulondolozo lwendalo ngokuthuthukiswa kolwazi, amandla, izimfanelo nokucabanga okubucayi kweningi labantu kodwa akubonakali kunje, ngale ndlela sakwazi ukuqonda ukuthi abafundi nothisha bayayibona imvelo. Lolu cwaningo lugcizelela ukuthi kunendima ebalulekile yokuzibandakanya kwabanye ababambiqhaza. Kuze kube manje, kuyahlongozwa yilolu cwaningo ukuthi ikharikhulamu ye-EE iphinde iphindwe futhi ukugcizelela ukubaluleka kokuqeqeshwa okuphelele kothisha madondana nokuhlanganiswa. Inhloso yalolu cwaningo bekukuthola ukuthi othisha kanye nabafundi ezikoleni ezintathu ezikhethiwe esikhungweni sezemfundo sase Ugu babona kanjani ukuhlanganiswa kwe-EE emakilasini.

Amagama agqamile: *Imvelo, Imfundo yezemvelo, Isitatimende senqubomgomo yokuhlola ikharikhulamu (CAPS) kanye nemfundo yokuqina okuqhubekayo (ESD).*

OPSOMMING

Omgewingsopvoeding (EE) is jare gelede by die skoolkurrikulum geintergeer. Volgens hierdie studie moet integrasie gevolg word deur implementering, daarom is de implementeringsproses suksesvol wanneer intagrasie suksesvol uitgevoer is. Hierdie studie het ten doel om te verstaan hoe onderwysers voldoen aan die kurrikulumbehoeftes van leeders voldoen om effektiewe onderrig en leer van EE te implementeer en om leeder voldoende kennis van EE te verwerf. Die metodologie wat by hierdie studie gebruik is, was ‘n kwalitatiewe navorsingsmetode, meervoudige gevallestudie- ontwerp en die teoriee wat gebruik is om hierdie studie te lei, was sosiale leerteorie en sosiale konstruktivisme teorie. Hierdie studie het ‘n doelgerigte steekproefnemingstegniek gebruik en drie sekondere skole is gemonster vir waarnemings, drie onderwysers in Natural Science (NS) in grad 8-klasse is geneem vir onderhoude en 24 leerders is gemonster vir fokusgroepe in grad 8-klasse. Die bevindinge van hierdie studie het aan die lig gebring dat daar ‘n gebrek aan kennis is met betrekking tot die versoging van die omgewing, en daar is ‘n teenstrydigheid tussen die EE- riglyne en –beleide wat deur die Departement van Onderwys (DvO) en die onderwyspraktyke van onderwysers aangebeid word. Alhoewel onderwys beskou word as ‘n noodsaaklike instrument in die bewaring van die natuur deur die ontwikkeling van inligting, aanleg, kwaliteite en kritiese denke deur die algemene bevolking, maar dit lyk nie meer so nie, kon ons op hierdie manier vestaan hoe leerders en onderwysers sien die omgewing waar. Hierdie studie impliseer dat die betrokeenheid van ander belanghebbendes ‘n belangrike rol speel. Tot dusver is deur hierdie studie aanbeveel dat die EE-kurrikulum herbesoek moet word en dit beklemtoon die belangrikheid van deeglike onderwyseropleiding met betrekking tot die integrasie. Die doel van hierdie studie was om te ondersoek hoe onderwysers en leerders in drie geselekteerde hoerskole in the UGU-onderwysdrik die integrasie van EE in die klaskamers waarneem.

Sleutelwoorde: *Omgewing, Omgewingsopvoeding, Kurrikulumassesseringsbeleidsverklaring (CAPS) en onderwys vir volhoubare ontwikkeling (ESD).*

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CHAPTER 1
INTRODUCTION

1.1. INTRODUCTION AND BACKGROUND

Our world is facing rapid ecological change. A lot of human activities that many sometimes do not take notice of negatively affects the environment and the elements that are treasured. For example, human activities such as mining that give rise to the economy of the country affect the environment in many ways.

The question then is, are teachers raising and grooming a generation who are ignorant of ecological concerns? A generation which does not care about their environment, but only cares about what they can get out of planet earth? Or are they raising ecological ambassadors who will stand for the future of others, and also develop ways in which the environment can be sustained? Currently, if people continue with this behaviour, they will end up with no planet at all because it will be destroyed by their hands, and being aware that all the elements that make up the planet will be long shattered if it is not preserved and taken care of. Everything around us is the environment, without the environment, there is no earth and without earth, there is no environment.

Bearing all this in mind, there is a great need for the teaching and learning of EE. According to UNESCO (1985), EE is a learning process that increases people's knowledge and awareness of the environment and associated challenges, develops the necessary skills and expertise to address the challenges, and fosters attitudes, motivations and commitments to make informed decisions and take responsible actions. This means that, EE is viewed as a process whereby the nation is taught about everything that concerns their surroundings. The researcher also believes that the word "nation" refers to the younger generations who are tremendously growing, and will someday lead the country and make decisions that will serve the existence of people. Irwin (2010:1) states that the planet has entered a phase of fast and rapid change which is because of the existence of humans.

This study explores teachers and learners' perceptions regarding the integration of EE in the curriculum of secondary schools in KwaZulu Natal (KZN). There is a worldwide concern about the continuous ecological degradation which demands that individuals change their thinking and practices about the environment (Kimaryo, 2011). Education is perceived to be an essential tool in the conservation of nature through the development of information, aptitudes, qualities and critical thinking by the general population (Navarro-Perez & Tidball, 2012). The government is challenged by increasing and pressing environmental problems, but the government seems powerless to prevent them. All of this is happening because of human demands on nature as well as technologies that are used to satisfy and improve our lives.

Education can take place anywhere, anyhow and anytime. Education can happen at home as learners can be educated by their immediate families. Education can take place in the community and in this way, learners learn about their values, culture and actions of their societies. However, most education takes place in schools. Schools are an ideal place for EE because when learners are taught in school, they can take what they have learnt and practically implement it in their homes and throughout the community. The necessity for EE has been stressed at many inter-governmental gatherings as a mechanism for addressing ecological issues. At these conferences, it has been proposed that different agencies ought to take steps to determine the global programmes for EE and to include it into the school curriculum (Irwin, 2010). Table 1 below indicate the conferences and the years they were held to promote EE.

Table 1: Conferences promoting EE

Bodies	Years	Resolution
1. The United Nations (UN) Conference on the Human Environment (HE), in Stockholm	1972	A resolution of this conference is on institutional and financial arrangements that proposed the establishment by the General Assembly of the United Nations of: an intergovernmental Governing

		Council for Environmental Programmes to provide general policy guidance for the direction and coordination of environmental programs; an environment secretariat headed by an executive director; an environment fund, to provide additional financing for environmental programs; and an interagency environmental co-ordinating board for the purpose of ensuring cooperation and coordination among all bodies concerned in the implementation of environmental programs.
2. The Belgrade Charter Conference, by the United Nations Educational Scientific and Cultural Organization (UNESCO).	1976	When EE is properly understood, it should constitute a comprehensive lifelong education, one responsive to changes in a rapidly changing world. It should prepare the individual for life through an understanding of the major problems of the contemporary world, and the provision of skills and attributes needed to play a productive role towards improving life and protecting the environment with due regard given to ethical values.
3. The Tbilisi Declaration, Georgia	1977	The resolution of this conference was on emphasising the important role of EE in the preservation and improvement of the world's environment, as well as in the sound and balanced development of the world's communities.

4. The Brundtland Report, by the World's Commission on Environment and Development (WCED)	1987	This conference's resolution was to unite countries to pursue sustainable development together.
5. Rio Earth Summit, by the UN Conference on Environment and Development (UNCED)	1992	The resolution of this summit was on the agreement on the climate change convention and not to carry out any activities on the lands of indigenous people that would cause environmental degradation or that would be culturally inappropriate.
6. The World Summit on Sustainable Development, Johannesburg	2002	To focus the world's attention and direct action towards meeting difficult challenges, including improving people's lives and conserving our natural resources in a world that is growing in population, with ever-increasing demands of food, water, shelter, sanitation, energy, health services and economic security.

As indicated by the Department of Basic Education (DBE) in (2011), one of the standards of the National Curriculum Statement (NCS) from Grade R to 12 is social and environmental justice and infusing such practices into their aspects of life to ensure the rights of people and inclusivity as stipulated in the constitution of South Africa (SA). Leal Filho, Raath, Lazzarini, Vargas, de Souza, Anholon, Quelhas, Haddad, Klavins and Orlovic (2018) states that the aim of education is to ensure that residents are transformed to be ecologically aware and part of this strategy could be accomplished by able teachers in the classroom. Irwin (1995), whom some consider as one of the founders of EE in SA, states that EE development was spearheaded by Non-Governmental Organisations (NGOs) and international agencies.

Despite the drive for EE over many years, there was little implementation in the country, or any state-driven endeavour to embrace EE into the formal school curriculum. Mosidi (1997) states that the first attempt to implement EE into the school syllabus was through the White Paper on EE in the year 1989. Kimaryo (2011) contends, however, that EE was included in the educational syllabus in SA in 1960 and stressed that within the Educational Training Policy (ETP) in 1989, but there was little evidence of progress in its implementation. The priority of the current age should be practical implementation of EE on a global scale (Palmer, 2003). In support of Palmer's proposal, schools in SA should have a clear understanding of how EE should be implemented.

Schools are based within the communities encompassing them, and should have a positive influence on what happens within those communities. However, Verma and Dhull (2017) states that EE has not been taught like it should be within schools. For example, Lindhe (1999) revealed that there was no impact from the teaching of EE in Tanzanian schools in their communities. Wehrmeyer (2017) disclosed that people are unaware of ecological issues even though they were educated. There is, therefore, a huge gap between what has been proposed and what actually happens in reality. Given this prevailing scenario with the implementation of EE, it is important to conduct a study on teachers and learners' perceptions towards integration of EE in the classrooms. The understanding of these perceptions will facilitate the discovery of ways in which formal teaching can be improved.

1.2. RATIONALE OF THE STUDY

The rationale for this study relies on the imperative to explore the teachers and learners' perceptions towards the integration of EE in the classroom. Learners' perceptions concerning environmental problems have also given impetus to this study, emphasising the need to address the challenges experienced by teachers and learners in teaching and learning EE.

Environmental problems in SA and the world at large are a cause for concern. The degradation of nature, management of waste and litter, degradation of wetlands, deforestation, contamination of land and poor conservation

measures are all major ecological issues, but learners are simply not conscious of them. Even if they are aware, they do not understand the reasons behind these problems and that the earth is impacted by the activities of human beings (Dalerum, 2014). Another reason for conducting this investigation originates from personal experience. The researcher is presently teaching within the Intermediate and Senior Phase as a Natural Science (NS) and Technology (TECH) teacher, and has personally witnessed that learners lack sufficient information about EE or the influence of their actions on the environment. This means that in places where EE is implemented its implementation is done at a superficial level.

Many learners throw papers imprudently anywhere in the school facilities and also in their communities. This garbage likely enters the storm water drains and streams and contaminates water sources and life that is dependent on aquatic environments. If such solid waste is not recycled, this may lead to diseases that are a threat to human lives. The SA Constitution (1996), in its Bill of Rights, enshrines the principle that all people have a right to an environment that does not harm their wellbeing and prosperity, and that ecology must be preserved for the advantage of both the present and future generations by practical, regulated and appropriate measures.

The National Environmental Management Act (1998) (NEMA) (Mosidi, 1997) emphasises that EE and training has an important role to play in guaranteeing the community's wellbeing and that it is through EE that information and skills may be shared to encourage broad-based participation. The researcher is of the opinion that many teachers lack the ability to deal with EE content within the educational programmes, and believes that it is essential for teachers to acquire an in-depth knowledge of EE to support practical living which will lead to an improvement of the economy. However, EE has been interpreted as both curriculum process and curriculum product (Gough and Gough, 2010). EE is viewed as a system to make people aware of the ecological crises that they face and how they can take precautions against them (Hume and Barry, 2015).For these reasons, the researcher was interested in investigating teachers and learners' perceptions of integration of EE in the classroom.

1.3. PROBLEM STATEMENT

Though EE has been included in the curriculum for most subjects, e.g. NS, there is a major concern that the teaching practices are not practical and efficient for the teaching and learning of EE. In support of this view, Cotton (2006) stated in his study that teachers lacked guidance about what sort of performance and behaviour is expected from learners regarding EE new content. This shows that EE is integrated in all subjects, but with each subject there are challenges with the content of EE in the curriculum. The researcher's interest in undertaking this study stems from personal observation. She has witnessed that in her town (uMzinto), where the school she teach at is located, is full of litter. Even though waste bins are provided, people do not use them, which leaves the town unclean and unhealthy for people to live in.

1.3.1. RESEARCH QUESTIONS

1.3.1.1. Main research question

The main research question of this study is;
What are teachers and learners' perceptions on the integration of EE in classrooms?

1.3.1.2. Sub questions

- What are teachers and learners' perceptions of EE?
- What are teachers' teaching practices used to effectively teach EE?
- How do learners perceive the learning and teaching of EE?
- How does the teaching of EE influence learner's behaviour?
- What challenges do teachers encounter that hinder effective teaching of EE?

1.3.2. RESEARCH PURPOSE, AIMS AND OBJECTIVES OF THE STUDY

1.3.2.1. Purpose

The purpose of this study was to investigate the perceptions of teachers and learners towards the integration of Environmental Education in the classroom.

1.3.2.2. Main Aim

This study sought to investigate how teachers' and learners' perceptions about integration of EE in the classroom influenced teaching and learning of EE.

1.3.2.3. The Objectives of the study are to

- Determine the teachers and learner's perceptions of EE;
- Explore teachers' teaching practices used to effectively teach EE and provide guidelines on how they should teach EE;
- Determine how learners perceive the teaching and learning of EE in schools;
- Determine the influence of teaching EE on learners; and
- Address challenges that teachers come across which hinders effective teaching of EE in classrooms.

1.4. CONTEXT OF THE STUDY AREA

The province of KZN is one of the nine provinces in SA. KZN has been known as a home for Zulu people. KZN is divided into eight different regions (Krishnamurthy, Jonathan, Srinivasalu and Glaeser, 2018). It stretches for 800 km across the east coast of SA (Krishnamurthy, Jonathan, Srinivasalu and Glaeser, 2018).

This study focusses on the Southern Coast of KZN, which is mostly famous for its beaches and a place for tourists to indulge in, and different resorts have developed over the years to meet the needs of tourists. The schools in which this study was undertaken are situated in the rural parts of the South Coast. Near these schools are places that look like dumping sites because people from informal settlements dump their waste there and it is not attended to, which causes a bad smell that permeates around the whole village. The population of KZN was last estimated in 2016 to be 11 065 240. The area is 94,361km^2 with a density of 117.3/km^2 (Krishnamurthy, Jonathan, Srinivasalu and Glaeser, 2018). Below this graph shows the population found in KZN:

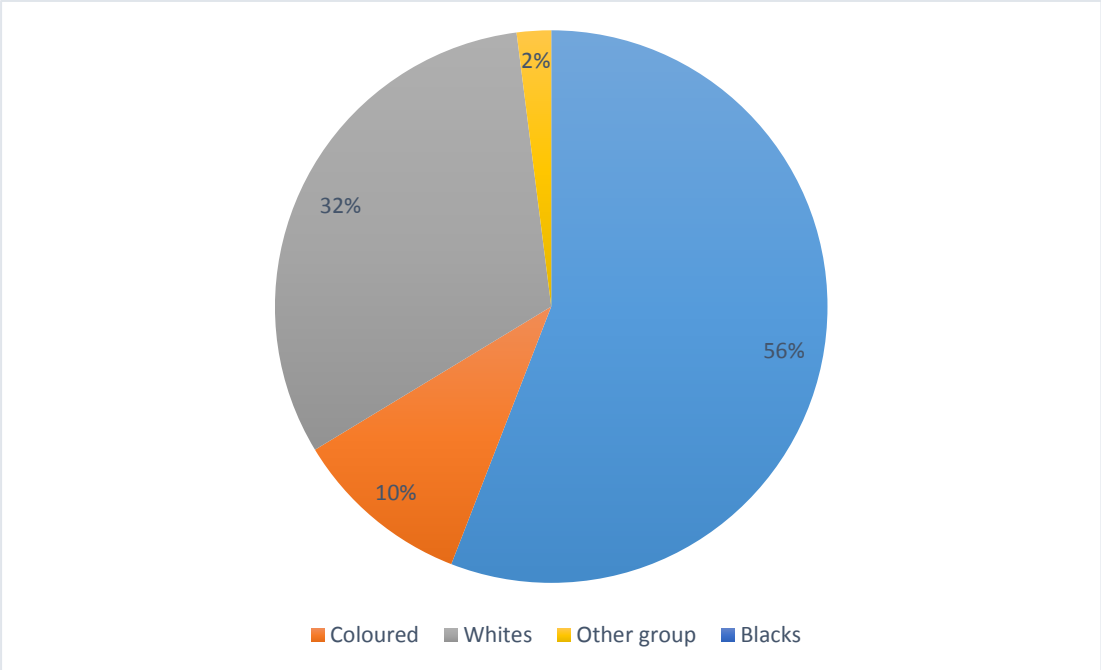

FIGURE 1: Population found in the South Coast.

The figure below shows where the South Coast is situated in the province of KZN

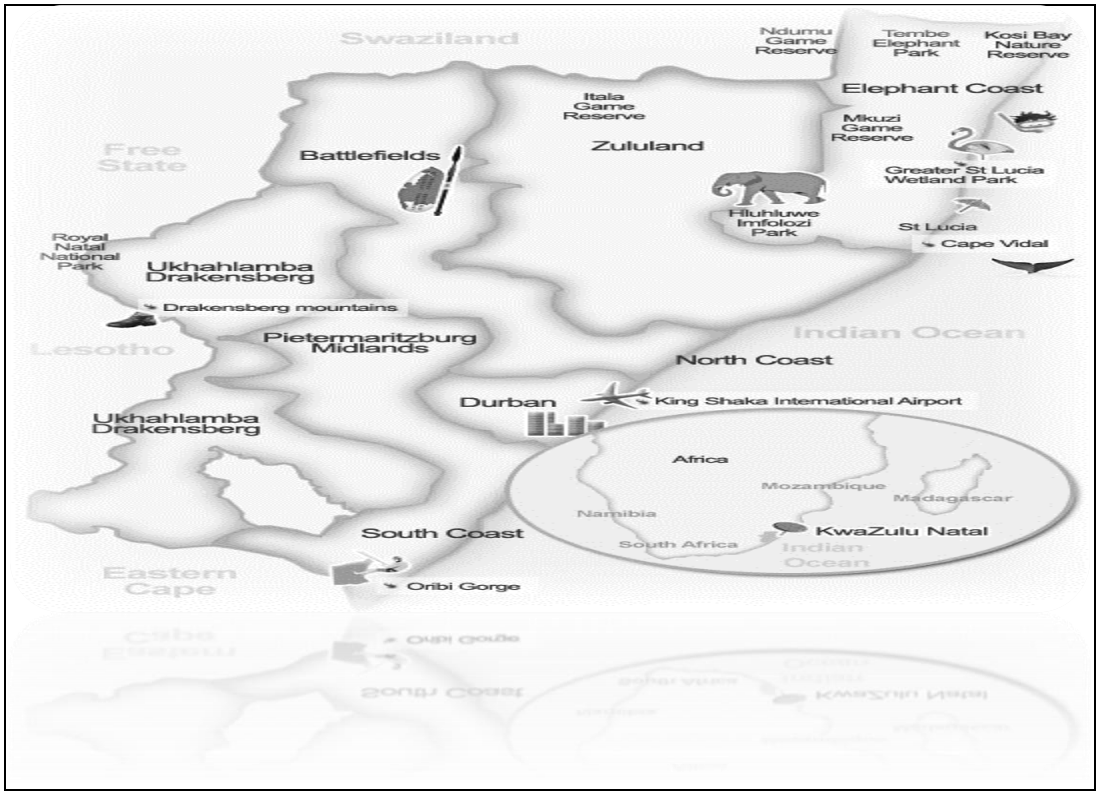

FIGURE 2: South Coast region

This study intends to assist in addressing the environmental concerns and implications of this behaviour and recommends ways in which learners and teachers can help educate their society about environmental problems and solutions to these issues.

1.5. RESEARCH METHODOLOGY

This research employs a qualitative research approach and a multiple case study design, as three different cases will be studied. Three NS teachers were selected for face-to-face interviews, 24 learners for focus groups and three schools for observations. The research methodology of this study aims to clarify which steps are necessary to be followed when conducting this study.

Research approach

A qualitative research approach, according to Hancock, Ockleford and Windridge (2009:6) studies behaviour in natural settings or uses people's accounts as data; usually with no manipulation of variables. This study

employed the use of a qualitative approach as this study was concerned with developing an explanation of the social phenomena.

Research design

Grover (2015:1) believes that a research approach is an overall strategy that a researcher chooses to attack a problem which requires integration of different components of the study in a coherent and logical way, thereby ensuring solving the given problem in an efficient way. Hence, this study used a multiple case study design, as the evidence that is generated from a multiple case study is rich and reliable (Gustafsson, 2017).

Sampling and techniques

Sampling is a process of selecting people from a population of interest so that by studying the sample results may be generalised and given back to the population from which they were chosen (Crossman, 2019). Purposive sampling was chosen for this study as the participants were purposively chosen from three research sites (Crossman, 2019). Three schools were sampled for observations, three NS teachers (1 for each school) were selected for face-to-face interviews and 24 learners were selected for focus groups in grade 8 NS classes.

Participants

Participants are people who take part in a study or in any organisation (Carpentier, 2012). In this study participants were purposively selected from three schools, whereby three teachers and 24 learners participated in this study.

1.6. ETHICAL CONSIDERACTIONS

As the study was conducted, the researcher was mindful of the ethical considerations. All of the ethical considerations were adhered to. Before the collection of data, letters were sent to the relevant department and schools in

which data was collected from. A briefing was provided and informed consent forms were signed by participants and parents of learners who were under the age of 18. Anonymity and confidentiality were maintained when the findings of the study were shared with the general public.

Permission to conduct the study

Wiersma and Jurs (2009: 436) explain that it is important to "obtain permission from the sites gatekeepers" when carrying out research in an educational environment. The researcher thus applied for the ethical clearance from the College of Education Committee of her university.

Informed consent from participants

According to Drew, Hardman and Hosp (2008:57), "consent involves the procedure by which an individual may choose whether or not to participate in a study". Participants were informed that their participation was on a voluntary basis and that they could withdraw from the study at any time without negative consequences.

Anonymity and confidentiality

According to McMillan and Schumacher (2010), the locations and names of individuals that participate in research should not be disclosed in printed publications. The details should be anonymised to maintain the participants' trust. Kvale and Brinkmann (2009: 72) concur that "participants right to privacy" must be guaranteed. Anonymity was assured in the letters to the gatekeepers and participants. The participant's details were not mentioned in this study and pseudonyms were used where necessary and appropriate. Codes will be employed to protect the identities of participants in the study.

1.7. DELIMITATIONS OF THE STUDY

Most studies have delimitations of the study. These are things which limits what is possible to be achieved by the research in question.

1.7.1. Delimitations of the study

Three secondary schools in the UGU education district were selected as research sites. The schools are close to where the researcher works and only NS teachers were asked to participate. As the researcher is also familiar with the subject area, it was easier to communicate with them. The data acquired was not shared between participants and was easily accessible for the researcher.

1.8. CONCEPTS USED IN THE STUDY

There are a number of concepts that are involved in EE and SD within the educational system. The following are concepts which were chosen to be used in this study.

1.8.1. Environment

The environment involves all biotic and abiotic components in our surroundings. Everything that exists naturally and artificially is regarded as the environment. Environment can also be regarded as a place in which all living creatures interact (Weichhart, 1979). This study has adopted this term to explain which aspects make up the environment. It is used to explain all the aspects that pertains our surroundings.

1.8.2. Education

Education can be regarded as a tool or a system to teach people about a certain topic. A process in which there is learning and teaching is regarded as education. The term education is a primary motivation within EE because a process of teaching learners can be best accomplished through educational facilities where effective learning can take place (Ramana, 2012). This study has used the term education to better explain the importance of education to learn about the environment.

1.8.3. Environmental education

EE is explained as a useful tool for environmental learning and teaching. The role of EE is to educate individuals about their environment in order to raise environmental specialists and ambassadors and create strategies to overcome the growing environmental crisis that is facing the planet (Downborough, 2012). The term EE is used to explain what the learning and teaching about the environment entails and the importance of learning about the environment to prevent the overspread of environmental issues.

1.8.4. Curriculum Assessment Policy Statement (CAPS)

CAPS is the curriculum plan that was introduced in 2012 and 2014 to replace NSC. It also aimed to strengthen environmental learning in the school setting (Kokela, 2017). This term has been to better explain which curriculum plan is adopted by the education system to teach in schools and which the integration of EE has been infused.

1.8.5. Education for Sustainable Development (ESD)

ESD is aimed at sustaining the lives of human beings. The education syllabus needs to be improved for the benefit of providing learners with strategies for sustainability (Mohanty and Dash, 2018). This term in this study explain the purpose of education to sustain the development in a country.

1.8.6. World environmental crises

The world faces a lot of environmental crises that affect life and makes the environment ill fit for living. This leaves humans and other species prone to dangers and diseases which may lead to death (Zvomuya, 2017). In this study, the term highlights the world environmental crises that our world is facing.

1.9. CHAPTER OUTLINE

This research is presented in five interrelated sections.

Chapter 1: this chapter gives the foundation of and reason for the study, and provides a comprehensive background to the research problem.

Chapter 2: this section discusses and provides a detailed literature review and discusses a theoretical framework which underpins the concept of EE, and focusses on studies regarding content, methods and resources of EE.

Chapter 3: this chapter presents the methodology of the study, the paradigm, design, data collection procedures and methods that will be used, population and sampling procedures and the analysis of data.

Chapter 4: this section deals with the data presentation, analysis and interpretation of data and documents the research findings of the study.

Chapter 5: in this final chapter of this study, the results are summarised and the implications for the implementation of the new EE policy in SA are discussed. This chapter explores the meaning of findings and the conclusions arising from the data analysis, makes recommendations to the Department of Basic Education, curriculum developers and teachers, and suggests some possible research areas to further illuminate the themes and issues found in this study.

1.10. SUMMARY

This chapter introduced this study and discussed the importance of undertaking this study. The purpose, aim, research questions, objectives and context of the study area are discussed to give thorough information to support why the study is important. It is stated by this study that the aim of EE is to create and groom environmentally conscious and literate individuals in whom

the future of the world can be ensured. This chapter shares the views of the researcher on supporting why the study was undertaken.

CHAPTER 2
LITERATURE REVIEW

2.1. INTRODUCTION

According to Hebe (2009), a literature review is a chosen method of printed and unpublished source materials employed by a researcher as support for the events of a topic of research. This chapter focuses on the literature review which is interrelated to the topic of this study.

2.2. STRUCTURE OF THE CHAPTER

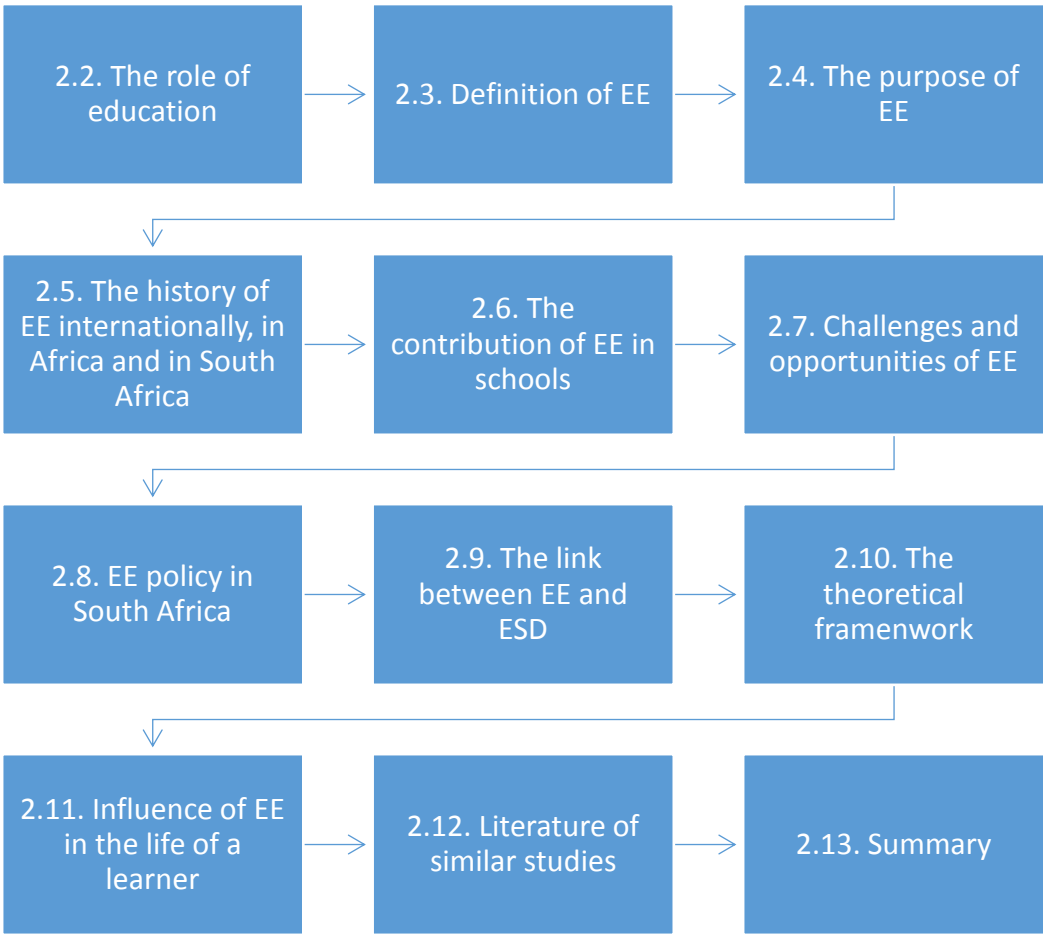

FIGURE: 3 STRUCTURE OF THE CHAPTER

Below is s discussion of what role education has. The researcher believes that the role of education is to groom an individual in early stages of life, teach him/her about the basics of life and also teach him/her how to put into action what they have learnt and also to make intensive decisions in life.

2.3. THE ROLE OF EDUCATION

According to the Idris, Hassan, Ya'acob, Gill and Awal (2012), education has a very crucial role to play in mitigating ecological issues and discovering environmental opportunities. EE should be included in all learning units of the formal education system to provide intensive understanding, knowledge, skills and values that are required by most organisations to solve ecological issues (UNESCO-UNEP, 1977). Non-formal education activities also have a crucial role to play in the wellbeing of individuals with the use of media exercises to create awareness across the globe.

All EE content, materials and techniques must be suitable for diverse learners needs (UNESCO-UNEP, 1977). In being consistent with UNESCO-UNEP (1977), the role of education is to create awareness and also provide knowledge of environmental issues towards individuals in the world and prepare individuals for the job market, which largely depends on working closely with people who need to take the environment into consideration in their activities such as architects, engineers, industrial managers and upcoming researchers Et cetera (etc.). There is a great need for innovating approaches and techniques in educational levels (Ferguson, Couglan, Egelandsdal, Gaved, Herodotou, Hillaire, Jones, Jowers, Kukulska-Hulme, McAndrew, Misiejuk, Ness, Rienties, Scanlon, Sharples, Wasson, Weller & Whitelock, 2019).

EE has countless definitions and some of them are given below. Some were introduced in conferences held in relation with the environment. Other definitions have been reviewed and one which was viewed as being suitable for this study was chosen.

2.4. DEFINITION OF EE

Below are the definitions of EE spelled out by different environmental organisations as well as the one to be used in this study.

According to UNESCO (1985), EE clarifies concepts and recognises values to develop attitudes and skills that are crucial for understanding and appreciating the relations of humankind, their culture and their environment.

UNESCO (1978), in the Tbilisi Declaration, stated that EE is a process of learning which contributes to an increase of environmental awareness and knowledge and the challenges that are associated with the environment. It also assists in developing the skills and necessary expertise to solve issues as well as to foster motivations, commitments and attitudes to take decisive action (UNESCO, 1978).

UNEP-IETC (2003), in their publication, stated that EE is achieved when people become aware of their ecological surroundings, acquire skills, expertise, values and knowledge and become determined, which will allow them to take action, whether collectively or individually, to find solutions to future ecological issues. The researcher preferred to use this definition for this study as it blends well with the purpose of this study.

The purpose of EE is discussed below, as EE is seen as a vital component in a person's life and the vision and mission, goals, aims, principles and objectives of EE have also been reviewed for better understanding of EE.

2.5. THE PURPOSE OF EE

EE is very important in an individuals' life, starting from birth until becoming elderly. The purpose of EE in an individuals' life is to create an environmentally literate individual. To the researchers' understanding, an individual contributes towards a wide social context and a community is made up of different individuals. According to Soos and Kovac (2008), the importance and significance of EE, as developing a solution towards today's environmental problems, is unquestionable. The different educational disciplines and reorientation has given birth to EE for meeting the needs of social communities and solving ecological issues (Tbilisi, 1977).

The solutions for these environmental issues are approached from completely different views, both by specialists and by teachers as well as by society as a whole (Soos and Kovac, 2008). There is a vital need for paying special attention in order to understand the interrelations between the environment and socio-economic improvement (Tbilisi, 1977). The purpose of EE is to provide knowledge for interpreting the different events that make up the environment, encourage improvement of the economy, encourage ethical behaviour and

constitute the basis of self-discipline that will help preserve and improve the environment. It also provides the necessary skills that are needed to solve ecological issues (Tbilisi, 1977).

NAAEE (2017) declared that the globe is faced with ecological, communal and economic problems such as dynamic climate shifts, loss of species and habitats, decreasing access to nature, unequal distribution of resources and alternative threats to human beings' well-being. NAAEE (2017) asserts that EE is capable of remodelling lives and communities by addressing the challenges through serving to form an actuated and devoted citizenship. EE informs, evokes and enlightens; it builds human capability, influences attitudes, may result in action and, most significantly, it will facilitate individuals to create abreast of choices concerning the environment that result in an informed position and a more sustainable society (NAAEE, 2017).

2.5.1. The Vision and Mission of EE

The vision of EE is to develop people who will use the ecological knowledge acquired to engage in ecological stewardship, whereas the mission of EE is to make sure that EE is dependent on sound science and working educational methods that are used as a material for the promotion and protection of human health, ecology and to encourage and motivate learners for better academical achievement (Eneji, Akpo & Edung, 2017).

2.5.2. The Aim of EE

The major aim of EE is Sustainable Development (SD), which is a sequence of different uses of resources with the aim of meeting the needs of people while at the same time preserving the resources and ecology for a better tomorrow (Eneji, Akpo & Edung, 2017). According to Lotz- Sisitka (2004), the aim of EE is to modify social change and to improve the standard of education and life. As discussed at the Tbilisi conference (1977), the basic aim of EE is to be successful in teaching communities and individuals about their natural world, the built environment and the results of interactions in the biosphere and how this impacts on the economy and physical world. It was further stated in this conference (Tbilisi, 1977) that another aim of EE is to clearly show the interdependence

between the ecology, political environment and the economy of the modern world. According to Soos and Kovac (2008), the aims of EE should be to:

1. **Motivate** one to acquaint with these experiences,
2. **Develop**, among others, an approach towards historical-ecology and systems, particularly to convey coherent and up-to-date knowledge-systems to learners,
3. **Assert** that nature is effective,
4. **Form** affective bonds while becoming familiar with and keen about nature, as if people tend to show emotions towards something, then they are more ready to secure and defend it, and to
5. **Make** environmentally-conscious thinking part of peoples' worth judgment.

Another aim of EE is to allow individuals to fully understand the completeness of the ecology and the importance of the worlds' population to adapt their actions and to develop the world while considering the environment (UNESCO-UNEP, 1977). Living conditions can be improved only if these aims are met. EE helps to raise awareness of the ecology, economy and political interdependency in the modern world to enhance responsibility and solidarity towards individuals (UNESCO-UNEP, 1977). This is a requirement for solving serious ecological issues which affect the global community, for example, air pollution or the extinction of species (UNESCO-UNEP, 1977).

2.5.3. The Goals of EE

As Stipulated at the Tbilisi conference (1977), goals of EE were endorsed as:

1. To cultivate clear attention to and concern about monetary, social, political and environmental relationships in urban and rustic territories.
2. To provide chances for every individual to gain values, knowledge, mentalities and responsibilities for securing and enhancing nature.
3. To trace peoples' behaviours, societies and gatherings all around the Earth.

At a conference held by the North American Association for Environmental Education (NAAEE, 2007:6), it was mentioned that a definitive goal of EE is the

improvement of an ecological educated citizenry, and develop proficient people who understand natural issues and the manner in which ecological quality is wedged by human decisions. Mosidi (1999) corroborates that the goal of EE is to build a total population that is attentive to and concerned about ecology and its related issues and that has the information, skills, attitudes, inspirations and duty to figure out, on an individual basis and jointly, arrangements of current issues and the hindrance of recent ones. This can be achieved by obtaining and nurturing the following: mindfulness, knowledge, attitude, skills, evaluation capacity and participation (Mosidi, 1999).

Kyburz-Graber, Hofer and Wolfensberger (2006) stated that five goals of EE were presented in the Stockholm Declaration Conference in 1972, as follows below:

1. To enhance accomplishments and stewardship.
2. Increase the limits of states to create and convey far reaching state-wide EE programs.
3. Promote research and evaluation of nature and improve environmental quality and student achievements.
4. Enhance quality, access and coordination of natural knowledge, assets and projects.
5. Advance and support ecological professions.

These goals are important for this study because they give a clear, comprehensive view of what is meant to be achieved by the teaching and learning of EE and what it aims to achieve. The goal of EE, as reviewed by this study, is to ensure that every individual is fully equipped with the skills and essentials to care for the environment and their well-being and to remind them of how reliant they are on the environment around them. This study will also look at environmental careers which most teachers and learners are not even aware of. As these goals stated above mention, the learning of EE will promote and encourage environmental careers, as developing environmental careers will be a suitable solution to mitigate environmental problems.

2.5.4. Principles of EE

The principles of EE were stipulated at the Tbilisi Declaration in 1977, in this conference 12 guiding principles were discussed as follows:

1. A conception of neighbourhood, national and worldwide collaboration of EE ought to be a non-stop, deep-rooted process, starting at the preschool level and proceeding through all formal and non-formal stages.
2. EE ought to consider the Earth in its totality - characteristic and built, social and technological.
3. EE ought to be interdisciplinary in its approach, drawing on the particular substance of each order in making conceivable, comprehensive and adjusted viewpoints.
4. EE ought to look at major natural issues, from nearby, national, worldwide and territorial perspectives with the goal that learners acquire knowledge of ecological conditions in other geological zones.
5. EE should concentrate on present and potential ecological circumstances while considering a verifiable point of view.
6. EE ought to advance the esteem in the counteractive action and arrangement of ecological issues.
7. EE should expressly think about ecological aspects in planning for improvement and development.
8. EE should empower learners to have roles in arranging their learning encounters and give a chance to settle on choices while tolerating their results.
9. EE should identify with ecological sensitivity, information, critical thinking abilities and qualities illuminating each age, yet with unique accentuations on ecological sensitivity which learners possess in early years.
10. EE should underline the multifaceted nature of ecological issues and, subsequently, the need to create basic reasoning and critical thinking abilities.
11. EE should allow learners to find the indications and genuine reasons for ecological issues.

12. EE should use different learning situations and an expansive cluster of instructive ways to deal with educating, finding out about and from the Earth with due weight on pragmatic exercises and direct involvement. EE should utilise diverse learning environments and a broad array of educational approaches to teaching, learning about and from the environment with due stress on practical activities and first-hand experience.

Grant (1997) came up with nine principles for EE. As stated by Grant (1997), the nine principles are as follows:

1. **Education ought to underscore our interdependence with different species, the planet and individuals:** he said that education is meant to explore the connections between people and other people, people with other species, individuals and the planet Earth (Grant, 1997). When people acknowledge how dependent they are on a healthy environment, they will initially take steps to preserve biodiversity, reduce worldwide imbalances and advance diverse comprehension with others (Grant, 1997).
2. **Education ought to assist learners to move from awareness to information to taking action:** knowing about nature does not prompt action. Learners must have chances to take actions based on the knowledge they have acquired. It is just when people attempt to solve ecological issues that they can completely comprehend them. Learning about the environment cannot be possible only by learning from textbooks, there has got to be activities involved that enhance participation. It is only then, when learners attempt to tackle ecological issues, they realise that none of these issues have been solved. This gives them the chance to develop basic reasoning abilities expected to develop solutions (Grant, 1997).
3. **People should reduce the consumption of natural resources:** 80% of the world's resources are consumed by 20% of the population across the world (Grant, 1997). Would this 20% of the population continue to benefit from natural resources and enjoy the same living standards if mismanagement of resources persists? Such questions should be posed

to learners to challenge them to come up with ways in which energy can be saved in their homes and schools (Grant, 1997).

4. **Opportunities for learners to develop a connection with their surroundings should be provided:** if learners do not know the environment, they will not be able to save it. A lot of individuals reside in cities which makes it impossible to grow an emotional bond with nature. EE can be used as a tool to assist people to identify that nature is everywhere, even in cities.
5. **Education must be perspective:** it is very important to think about the future when considering resolving ecological issues. A useful method to sustain the future is to expand possible panoramas of the future. Environmentally friendly possibilities can be considered as to where the recent trail of growth is leading. This can enable learners to think about ways in which they would want to achieve a sustainable world.
6. **Historical people must be consulted in order to regain connections to the world:** it would be useful to consult elders and grandparents around societies who can explain what the environment used to be in past compared to present communities. It is vital for the younger generations to understand that before this present generation, people used to live and enjoy their lives in the environment.
7. **Teachers should consider teaching every subject through media lessons:** Media utilising environmental advertisements would be helpful to build self-images to learners and expand environmental awareness amongst people everywhere.
8. **Teachers should be facilitators:** teachers need to facilitate learners that they can also learn from. As teachers, we do not need to merely teach learners how they can solve problems, we should also help learners to incorporate ways to overcome and solve these problems.
9. **Teachers should carry themselves as role models:** teachers must be able to influence their learners and they must know that they are the role models of their learners. A study done by Bandura (1971) has proven that if parents, teachers and other adults who are close to them care about and are concerned for the environment, learners are less likely to have a bad

attitude towards it. It is very important that teachers follow the saying that's says "you must walk the talk".

The principles that were adopted by this study were the Tbilisi principles, as the importance of these principles in this study is to guide and remind teachers and learners about the importance of EE and to encourage participatory and observational skills in teachers and learners through explorations with nature.

2.5.5. Objectives of EE

According to the UNESCO-UNEP (1996), some EE objectives were stipulated and discussed as follows:

1. **Awareness:** to assist individuals to obtain intensive knowledge about the environment, ecological issues and possible ways to resolve these problems.
2. **Knowledge:** to assist individuals obtain experience about the environment and the problems associated with the environment.
3. **Attitudes:** to assist individuals to gain a set of merits and an inspiration to actively participate in the improvement of the environment.
4. **Skills:** to assist individuals to obtain the skills required to identify and solve the ecological issues.
5. **Participation:** to present individuals with opportunities that will actively involve them in all levels of developing and resolving ecological issues facing our world.

The following section discusses the historical background of the study and shows the trails of EE Internationally, in Africa and in South Africa.

2.6. HISTORICAL BACKGROUND OF EE INTERNATIONALLY, IN AFRICA AND IN SOUTH AFRICA

EE has evolved internationally, in Africa and in SA. EE was first infused into the school curriculum on an international level, then to the African continent. A lot of conferences were held to support EE as major environmental problems were encountered. Most of the conferences concerning EE were held in America and

therefore literature in this chapter focusses more on the American context, as revolutionary EE has emerged from this context. It was alluded to by Irwin and Lotz-Sisitka (2005) that EE first took form in Greece, China and India many years ago.

According to Irwin and Lotz-Sisitka (2005), EE first started in the 19th century during the Industrial Revolution, which led to a lot of individuals becoming isolated from the natural environment. The Industrial Revolution also led to cultural interference in western sophistication. It generated lavish requests for a higher production of goods which decremented natural resources (Mohammed, 2016). This technological revolution started from Europe and spread to Asia and the United States (US) (Mohammed, 2016). Mohammed (2016) further infers that ecological protection initiatives were then developed in order to sustain and save the environment from the ecological contaminations that took place before the technological revolution.

2.6.1. International History

According to Pawlowski (2011), the history of EE can be traced back to individuals who lived long ago, who cared for the animals and plants that were beneficial to them. They consecrated some areas that they considered as holy according to their religions and this is regarded as another part of EE informal perspectives. Irwin and Lotz-Sisitka (2005) stated that EE can be traced back to Greece, Egypt, China and India. In Egypt the Pharaoh assigned scribes to teach farmers where and how to plant crops. 3000 years ago, in China, educational programmes were developed for the encouragement of the purpose of the economy by SD and reforestation (Irwin & Lotz-Sisitka, 2005). In Greece during the 4th century, Theophrastus contended for a structure of unsegregated ecological management for better use of resources (Irwin & Lotz-Sisitka, 2005).

Biedenweg and Monroe (2013) mention that EE was influenced by philosophers like Jean-Jacques Rousseau (1712- 1778), who felt that education ought to maintain a spotlight on the environment. McCrea (2006) corroborated that EE owes it origins to teachers like Louis Agassiz (1807- 1873), who inspired students to review nature, not books. EE started within the conservation education nature

in the 1930's "Dust Bowl" era, or rather the pollution saga, due to ecological concerns that were identified at the 1970's Earth Day (McCrea, 2006). According to Gough (2010), EE started in the 1960's, in which it was termed educational dimensions of the environment, which concentrated on water and air contamination, population increase, the exceeding exhaustion of natural resources etc.

2.6.1.1. Early Influences of EE

By the 1800's

Louis Agassiz was born on the 28th of May 1807. He displayed a love of nature and observation from a young age and grew to become a famous scientist who used articles within the fashionable press to gain support for his scientific theories and urged his learners to learn directly from nature (Biedenweg & Monroe, 2013). In 1854, Patrick Geddes, a Scottish botanist and urban planner, implemented an interdisciplinary approach to teaching by encouraging learners to learn by doing (Biedenweg & Monroe, 2013). In 1889, Jean-Jacques Rousseau published a book titled "Emile" or "Concerning Education", which is an academic philosophy written in the style of a novel. He maintained in it that educators ought to embrace attention on ecology, and contended that the responsibility of a teacher is to ensure that opportunities for learners to find out and discuss the processes of the development of humans and the impacts of their learning and teaching are well facilitated (Rousseau, 1889). Eneji, Akpo and Edung (2017) state that a foundation for solid EE programs was laid by these scholars, known as nature study, which took place in the late 19th and 20th centuries. In 1891, Wilbur Jackman wrote "Nature study for the Common School" which outlined the character study movement (McCrea, 2006).

By the 1900's

In 1905, Liberty Hyde Bailey, recognised plant scientist, school administrator, teacher and advocate of nature study, rejected the utilisation of EE as he thought it inaccurate, theoretical, and overblown and would continuously have to be explained (William, 2014). In 1908, the American Nature Study Society was established with Liberty Hyde Bailey as its initial president (McCrea, 2006). In 1911, Anna Botsford Comstock wrote the "Handbook for Nature Study" (Eneji,

Akpo & Edung, 2017). In the 1920's, ecology began to develop as a scientific field, and it bestowed a comprehensive view of the natural world and an integrated approach to its study (McCrea, 2006). In Nigeria, efforts of protecting the environment have long been in existence since the 1900's when it was under British colonial rule (Adelegan, 2006).

2.6.1.2. The Conservation Education Era

In the 1930's, the "Dust Bowl" within the American region gave rise to the conservation education movement supported by state and federal natural resource agencies as well as several non-governmental organisations (NGOs). Biedenweg and Monroe (2013) assert that John Dewey, who led the progress of education motion, developed a lot of education practices that were centred on students and have a holistic approach. This motion encircled numerous education methods that are needed in EE learning and teaching (McCrea, 2006).

Partnership with UNESCO is beneficial when regarding EE, which was developed in 1946. UNESCO is mostly concerned with issues of developing educational aspects. Due to interacting with the International Union for Conservation of Nature (IUCN), it then formed a part in developing EE (Mohammed, 2016).

The term EE was first used at a meeting in 1948 in Paris by Pritchard Thomas, and it was the first time it was generally used in the IUCN (Palmer, 1999). Two world wars took place in Europe, Asia and Africa during the technological revolution. The first ecological organisation was established soon after the Second World War. The IUCN was formed in 1948 along with other organisations. It was mostly concerned with biodiversity and wildlife (Mohammed, 2016). In 1953, the Conservation Education Association (CEA) was shaped to support various teachers operating within the field of conservation education (McCrea, 2006).

2.6.1.3. The Foundation for Contemporary Environmental Education

Carter and Simmons (2010) state that environmental focus can be traced back to just after the Second World War, however it did not have much emphasis until the 1960's. EE in Sweden emerged in the1960's, in which they mainly focussed on contamination and plant protection (Radeiski, 2009). Sweden's ecological policy was aimed at creating a community in which the current and future generations have an environment that guarantees healthy living (Radeiski, 2009). The World Wildlife Fund was developed in 1961, aimed at raising and securing wildlife preservation funding (Irwin & Lotz-Sisitka, 2005). They interacted with different and numerous governmental institutions in regards to ecological problems that are faced by the world. The National Act was passed, which aimed to decree a national policy which encourages productivity and harmonious interactions between nature and human beings as well as to introduce alternative solutions to save the environment from harm etc., (Carter & Simmons, 2010).

The description of EE was then developed at the University of Michigan by Dr Stapp and his learners (Stapp, Havlick, Bennett, Bryan, Fulton & MacGregor, 1969). Parizanganeh, Lakhan, Yazdani and Ahmad (2011) state that in Iran, most Iranians were born before 1970 were not exposed to or aware of environmental and sustainability problems and were not concerned about the environment. In Australia, the first National conference which focussed on EE was held in 1970 by the auspices of the Australian Academy of Science (Gough, 2011). During this time, environmental issues were seen as a scientific issue which could only be solved through science and technology, but scientists of the time argued that science and technology alone cannot solve these environmental problems (Gough, 2011). EE emerged in Brazil during the 1970s, during the earliest environmental movements and the emergence of organisations striving towards the conservation of nature (Carvalho & Frizzo, 2016). In Brazil, EE is seen as a part of the environmental turn in Western societies, which is led by ecological movements that started in the middle of the 20th century (Carvalho & Frizzo, 2016). The measures of environmental protection in China started in the 1970's (Tian & Wang, 2015). In Germany, EE was included in the curriculum in the 1970's as well (Radeiski, 2009).

The NAAEE was established in 1971, this is an organisation for ecological teachers (Disinger, 2001). In 1971, ecological awareness was regarded as a vital tool to develop the initial ecological policy program in Germany (Radeiski, 2009). In 1972, the UN conference on Human Environment (HE) in Stockholm, Sweden suggested 96 calls concerning the supply of EE as a solution to ecological issues (Eneji, Akpo & Edung, 2017). The EE revolution in Iran was established by the Department of Environment (DoE) (Shobeiri & Meiboudi, 2014). Sadough (2003) states that Iran became interested in EE during the HE and IUCN conferences held by the UN in Stockholm in 1972. The Alliance for EE (AEE) was established in 1972. AEE is a massive group promoting EE that is made up of many different international, national and regional organisations (The Alliance was disbanded in the mid-1990's) (McCrea, 2006). A significant description of EE was established in 1971 by the IUCN (Melville, 2007). In 1972, the National Secretary of Environment was established by the government, created as a response to the international debate that was raised in the UN conference on the Human Environment in the Stockholm conference (Carvalho & Frizzo, 2016). In 1973, China promoted and implemented EE (Tian & Wang, 2015). The first National Meeting on Environmental protection in was held 1973 and called for efforts to conduct research, communication and education on environmental protection for the first time (Tian & Wang, 2015).

The conference in Belgrade was sponsored by UNESCO in 1975, and it was in this conference that the Belgrade Charter was signed. This charter demarcated the fundamental constitution of EE; the AEE and World Regional Environmental Education Council (WREEC) controlled the Snowmass Conference- EE: Views and Prospective. The EE Office acted as the organiser of federal EE efforts (Carter, 2006). McCrea (2006) further corroborates that the EE Office was funded to develop EE teachers and to equip them with the skills necessary for their development. Funds were awarded in order to ensure the development of an EE curriculum. The WREEC was then developed to build a web and coalition between education and the environment to support EE (Carter, 2006). On April 22, in1975, 20 million individuals across America celebrated the first Earth Day, which was an event organised in response to issues concerning contamination and universal ecological quality (McCrea, 2006).

The WREEC and American Forest Foundation established Project Learning Tree (PLT) in 1976, which assisted learners in gaining awareness and information of the technological and natural environments, their duties and their contribution towards it (McCrea, 2006). The international regional conference on EE was held in St. Louis and the report was shared at the North American seminar on EE (McCrea, 2006). Among various papers, this report enclosed John Hug's "Two Hats" essay and Gary Harvey's "A Conceptualization of EE" (McCrea, 2006).
The intergovernmental conference on EE was held in 1977, in Tbilisi, Georgia by UNESCO and UNEP (Eneji, Akpo & Edung, 2017). In this conference the goals, aims, objectives and principles of EE were laid out, which are currently used by teachers in schools (Tbilisi, 1977). In 1978, the National Leadership Conference on EE was held in Washington, D.C., which created the report From Ought to Action (McCrea, 2006). Since 1978, China has registered highly visible economic growth which has led to serious ecological issues (Tian & Wang, 2015).

In the 1980's, EE spread through the acceleration of ecological groups in Brazil (Carvalho & Frizzo, 2016). It was in the same period that teachers in Brazil were considered to be ecological teachers (Carvalho & Frizzo, 2016). NAAEE printed Research in EE in 1981 (NAAEE, 1981). In 1983, the WREEC and the Western Association of Fish and Wildlife Agencies developed Project WILD (PW), which focussed on preservation and ecological teaching programs with particular attention to wildlife (McCrea, 2006). The inclusion of EE within the fundamental and secondary level in 1983, in Slovenia was also notable (Motshegoa, 2006).

In 1984, the Summary of research in EE was printed (NAAEE, 1981). The National Conference of experience exchange and academic seminar on EE in elementary and secondary schools in 1985 in China, cooperated for the first time with the same efforts of the department of education and the ecological conservation department (Tian & Wang, 2015).

An international conference on EE was held in Moscow (Irwin & Lotz-Sisitka, 2005). A description of EE was established in this conference. The Brundtland

Report was printed by the WCED. The idea of SD was introduced in this report (WCED, 1987) and again on the same year the first organisation of EE was established in England was in 1988 (Grace & Sharp, 2000). Schools were encouraged to contemplate EE from social, economic and other perspectives (Grace & Sharp, 2000). In the year of 1988 in Nigeria the fusion of EE was supported and encouraged by the Nigerian Conservation Foundation (Bosah, 2013).

The teaching of EE is guided by the national curriculum (Grayford, 1991). EE was just a learning area with no attachments to the past, but its vitality was stressed further. Grayford (1991) states that it is absolutely the decision of the school on how EE should be taught when following the national curriculum document (Grayford, 1991), and its purpose should be to address all of the issues associated with the teaching and learning of EE such as time consumption, lack of resources and skilled EE teachers etc. In 1988, the need for EE was strengthened in the Constitution of the Federative Republic of Brazil (Carvalho & Frizzo, 2016:3). Then in 1989, NAAEE initiated a cooperative program of affiliation with waste and provincial environmental education associations (NAAEE, 1989).

2.6.1.4. Programs and Building for the Future

The Council for EE and the water course initiated Project Water Education for Teachers (WET), which expedited and promoted awareness, appreciation, data and the spotting of water resources in learners (NAAEE, 2000). In 1991, the National Environmental Education Advancement Project (NEEAP) was established by the University of Wisconsin-Stevens Point (UWSP) (NAAEE, 2000). In the same year, the First National People of Colour Environmental Leadership Summit was held in Washington, D.C., and it was during this summit that participants adopted the principles of Environmental Justice (McCrea, 2006). Palmer (1999) indicates that the Slovenian curricula pre-dated this since 1991. EE in Slovenia is included among other learning areas, mostly social and natural sciences, and is not taught as an isolated learning area (Palmer, 1999).

In 1992, the US Environmental Protection Agency awarded its first Enhancing Excellence in Teaching Program (EETP) to the National Consortium for EE and Training, a cooperative partnership that was led by the University of Michigan (McCrea, 2006). In the same year, the Council of State Governments, EE Sub-committee and National Environmental Task Force produced a Model EE Act with recommendations that state legislatures adopt it (McCrea, 2006).

The UN conducted a conference on Environment and Development in Rio de Janeiro, Brazil, (UN, 1992). In this conference, Chapter 36 of Agenda 21 focused on reorienting education towards sustainable development, increasing public awareness and promoting training (UN, 1992). UNESCO and the International Chamber of Commerce (ICC), in cooperation with the UNEP, sponsored a World Congress for Education and Communication on Environment and Development (ECO-ED). ECO-ED aimed to improve accuracy for stimulating abreast action, delivery and quality education in ecology and the development of sustainability (UNESCO-UNEP, 1992). ECO-ED initiated cooperation amongst professionals, namely teachers, science experts, media and government institutions (UNESCO-UNEP, 1992).

In 1993, the NAAEE initiated the National Project for Excellence in Environmental Education. This project worked to form pointers for EE (NAAEE, 1993). The National Association for Interpretation formed an Environmental Education Section (McCrea, 2006). In 1994, the President's Council on Sustainable Development commanded the National Forum on Partnerships Supporting Education concerning the environment, at the Presidio, San Francisco, California, and as a result of this meeting the report Education for Sustainability: An Agenda for Action was created (McCrea, 2006).

In 1995, President Clinton issued Executive Order 12898, "Federal Actions to handle Environmental Justice in Minority and Low-Income Populations". Topics addressed included Agency Responsibilities Research, Data Collection and Analysis, Subsistence Consumption of Fish and Wildlife and Public Participation and Access to information (McCrea, 2006). In 1996, the NAAEE's National Project for Excellence in Environmental Education (NPEEE) created EE

materials: Guidelines for Excellence with support from EETAP. These guidelines were a collection of recommendations for developing and choosing EE materials (NAAEE, 2001).

A National EE Summit was held in Burlingame, California by the NAAEE. More than fifty organisations gathered in this conference to discuss the issues of EE in the US for collaboration and network creation all around the country and ten journal papers were proceeded in the important aspects of EE (NAAEE, 2001). In 1997, Educating for a Sustainable Future was published by the President's Council on Sustainable Development (McCrea, 2006). In the same year, in Thessaloniki, Greece, a conference was held by UNESCO where approximately 1200 specialists attended and the Thessaloniki Declaration was produced (UNESCO, 1997).

In 1998, the NAAEE, with support from EETAP, created the paper "Environmental Literacy within the United States: What should be …What is… Getting Here to There" (NAAEE, 1998). The National Environmental Education Advancement Project produced Definitions of Components of State-level Comprehensive Environmental Education programs. These comprehensive EE programs were a mixture of structure, funding and program elements that served to include EE into academic establishments at state and local levels (McCrea, 2006). McCrea (2006) further declared that the report supported the 1988 survey of the standing of EE in the US. The State Education and Environment Roundtable published its report "Closing the Achievement Gap: Using the Environment as an Integrating Context of Learning" (McCrea, 2006).

In 1999, the NEEAP produced a "Survey of EE in the US". The Journal of EE later published the survey (McCrea, 2006). The NAAEE's National Project for Excellence in EE produced Excellence in EE: Guidelines for learning K-12 with support from EETAP, and these guidelines provided learners, parents, educators, home scholars, policy makers and the public with a set of common, voluntary guidelines for environmental education (NAAEE, 1999). In 1999, Brazil adopted a National Environmental Education Policy (NEEP) with the ratification of Law 979 (Carvalho & Frizzo, 2016).

By the 2000's

In 2000, Guidelines were established by the NAAEE in cooperation with EETAP to prepare teachers for the teaching of EE (NAAEE, 2000). During the same year, the EE for a Sustainable future: National Action Plan (NAP) was launched in Australia in July (Tilbury, 2006), which led to the engagement of ideas of sustainability all around Australia (Tilbury, 2006). Tilbury (2006) stated that it led to the establishment of the National EE Council (NEEC) during the same year. Carvalho and Frizzo (2016) states that during the 2000's, the educational changes made following the National Curriculum Parameters and Guidelines that were established in 1997 contributed to the institutionalisation of EE in the Brazil. Carvalho and Frizzo (2016:3) further mention that the EE institutionalisation process through public policies began in the 1980's and was consolidated in the 1990's. In 2001 the National EE Network (NEEN) was established (Tilbury, 2006).

In 2002, the Johannesburg Summit was held in Johannesburg by the United Nations Commission on Sustainable Development (UNCSD) in SA. At this summit a lot of people were gathered together to focus on coming up with strategies to conserve natural resources (UN, 2002). In the same year, the United Nations General Assembly passed a resolution declaring 2005-2014 as the Decade of Education for Sustainable Development and UNESCO was designated as a lead agency for the promotion of the decade (UNESCO, 2002). In the same year, the Ethiopian Environment Protection Authority (EEPA) formulated a new environment policy (Yeshalem, 2013). In 2003 the NAP was launched in Australia and led to the establishment of the Australian Research Institute in Education for Sustainability (ARIES) (Tilbury, 2006).

In 2004, The NAAEE's National Project for Excellence in EE produced Non-formal EE programs: Guidelines for Excellence with support from EETAP. These guidelines were a set of recommendations for developing and administering high quality Non-formal environmental education programs (NAAEE, 2004). The first national EE week was held by the National EE and Training Foundation in 2005 (NEETF, 2005). The Education for Sustainable future conference was held by

the Centre of EE in Ahmedabad, India in 2005, in which a lot of people attended, and ended by a declaration being produced (UNESCO, 2005).

2.6.1.6. Recent International EE History

As mentioned earlier in this chapter, Irwin and Lotz-Sisitka (2005) mentioned that before the 20th century EE started from China, India, Egypt and Greece. The NAAEE (2007) states that EE movements were implemented in schools during the 1800's and still exist in schools to this day.

In 2007, a fourth international conference on EE was held in Ahmedabad in India, where it emerged with the Ahmadabad declaration, which states that education is for life and life through education (UNESCO-UNEP, 2007:1), and stressed the need for green jobs for young entrepreneurs which were emphasised so that the developing world can fight climate change and contribute to local economies. According to the NAAEE (2007), education should not only focus on the preservation of natural resources and outdoor teachings, but there is also a need to make decisions and to participate in democratic action. NAAEE (2007) further states that much of the work in EE has been guided by the Belgrade Charter (UNESCO-UNEP, 1976) and the Tbilisi Declaration (UNESCO, 1978), as these two documents furnish an internationally accepted blueprint for EE. In 2009, in Australia, the DoE, water, heritage and Arts (DoEWHA) published the NAP: Living Sustainable plan, which built the foundation and the contribution of Australia participation in the UN decade for action (Gough, 2011).

In 2011, the NAAEE's 40th Anniversary conference was held in October in the city of Raleigh, North Carolina. In this conference, six strands were discussed in detail, namely: climate change education, conservation education, EE goes to school, environmental issues in EE, environmental justice and network and leadership development (NAAEE, 2011).

In 2012, the NAAEE 41st Annual international conference was held in October in the city of Oakland, California. Six strands characterised this conference, namely conservation education, food and agriculture, green schools, marine, bay and

freshwater education, networking and leadership development as well as socio-ecological education (NAAEE, 2012). According to the NAAEE (2012), under these strands the following purposes were stressed: preservation pedagogy, food and agriculture, green schools, marine, bay and freshwater education, networking and leadership development, supporting and advancing high quality EE programs, socio-ecological education - exploring the vital connections between societies, integrating education and activism and cultural and environmental concerns.

In October 2013, the NAAEE hosted a 42nd annual international conference which was held at Baltimore, Maryland. The theme of this conference was “Celebrating the power of EE” (NAAEE, 2013). The NAAEE (2013) mentioned that their strands focussed on everything from sustainable communities and conservation and behaviour changes to connecting kids to nature and more. They further emphasised that seven thematic strands characterised the conference which are: civilian agrology and general engagement in experimentation, hitch learners with the environment, preservation pedagogy and change of conduct, greening and formal education, leadership and innovation, sustainable communities and teahing about ecological problem (NAAEE, 2013).

In 2014, the Methods of Teaching Environmental Education revised workshop was held in North Carolina, which was a required workshop for the N.C. Environmental Education Certification Program. It was added to the program in 2009 after program enrolees and certified environmental educators agreed that a workshop was needed to provide basic knowledge of the discipline and to impart practical skills, techniques and resources for educators of all excellence levels. In 2015, the NAAEE hosted a 44th Annual international conference in San Diego, the purpose of which was to strengthen the core ideas of the conference and stimulate new thinking that will best meet the environmental and social challenges of the next decade (NAAEE, 2015).

In October 2016, the NAAEE’s 45th Annual conference was held at Madison as well as the 13th Annual Research Symposium. According to the NAAEE (2016),

the NAAEE's Annual Research Symposium brought together academic figures from various communities to investigate the future and current directions of EE and to progress the practices used that would be the most efficient. The NAAEE (2016), mentioned that six cutting-edge thematic strands characterised this conference, namely increasing the knowledge of the impacts of research, knowledge of ecological and conservational education, raising awareness towards sustainability measures, green schools, inspiring connections to the outdoors and leadership and capacity building.

In 2017, UNESCO released a publication termed "Education for Sustainable Development Goals: Learning Objectives". According to the UNESCO (2017), the adoption of Agenda for SD took place in 2015 by the UN General Assembly. The development of a new world framework was redirected towards humans for sustainability after the UN conference for SD in 2012 in Rio de Janeiro, Brazil (UNESCO, 2017). UNESCO (2017) mentions that at the core of the 2030 Agenda are 17 Sustainable Development Goals (SDGs). The 17 SDGs are aimed at securing sustainability, prosperity, peace and equitability and quality lives for all humans in the world and the upcoming generations (UNESCO, 2017).

The NAAEE 46th Annual international conference was held in October 2017 in Puerto Rico, in San Juan. The theme of this conference was "Imagine a World" which builds on more than four decades of work to think creatively and collectively about how we can create a more sustainable future (NAAEE, 2017). According to UNESCO (2017), The United Nations Decade of Education for Sustainable Development (2005-2014) (DESD) aims to integrate the practices and principles of SD in all learning and education aspects in order to have a more sustainable future.

In 2018, a conference was held by the Idaho Environmental Education Association (IdEEA) in Idaho, where they offered small grants to support EE for Idaho's youth. In the Idaho EE conference (2018), it was mentioned that proposals were invited from educators of all kinds of projects to help children to learn more about EE or enhance children's connections with nature. The Golden

Eagle Audubon Society also provides small grants to individuals or non-profit organisations for projects that benefit their habitats in Idaho (Idaho, 2018).

As mentioned earlier, it can be seen that EE conferences have been mostly held in America. The researcher strongly believes that EE has also emerged in Africa from many decades ago and in African countries EE has been included in their education curriculum to better mitigate the environmental problems facing these countries. Below the African history of EE is discussed and a few African countries have been selected.

2.6.2. African History of Environmental Education

EE in African countries has long been introduced on many different occasions. In this study only four countries that fall within the African continent are discussed, namely Egypt, Tanzania, Zimbabwe and South Africa.

2.6.2.1. History of EE in Egypt

Egypt follows the main trends of EE that can be seen all over the world. This involves the growing concern of the importance of EE and the initiation of EE programs that fit into the school curriculum. Workshops have been held over the last few years in Egypt. The first workshop was held in Ain Shams in 1997, which is where EE was first introduced in secondary schools' curriculum. It discussed many problems and has put forward the foundations for introducing curricula at other school levels (UNESCO, 1999:20).

In a workshop held in Aswan, it was recommended that EE programmes must be established in relation to natural conservation in all university levels and funds need to be allocated for ecological-based universities (UNEP, 1999). The emphasis was on the role of women in preserving biodiversity (UNEP, 1999). Another workshop in Alexandria, in 1997, emphasised equity of gender education and another emphasis was on the development of concepts in education for sustainability (UNEP, 1999). There was also an emphasis on the participation of learners in the implementation of ecological laws in communities and schools (UNESCO, 1999). Another workshop was held in Cairo in 1997, where the acceleration of environmental shortages of human power was

discussed. It was concluded that it was due to a lack of an ecological curriculum in universities (UNESCO, 1999).

2.6.2.2. History of EE in Tanzania

According to Ahmad, Krogh and Gjotterud (2014), in Tanzania in 1995, the government was struggling to provide education as a tool for promoting development in the country. In 1961, a policy was produced titled “Education for Self-Reliance” (Ahmad, Krogh and Gjotterud ,2014), the purpose of which was developing the enquiring mind, the learning ability, learning abilities from other people, abilities of contributing to the community and the ability to appreciate and develop national culture (Ahmad, Krogh and Gjotterud, 2014). Ellen and Downie (1999) stated that the need of EE to improve the management of natural resources which serve the primary need for SD was noticed. In Tanzania, the early initiation of EE started in the 1990’s through a programme by the National Environmental Management Council (NEMC) and other environmental groups. These programmes were expanded and included other stakeholders (Ahmad, Krogh and Gjotterud, 2014). The purpose of these programmes was to bring change to the attitudes of the citizens towards their environment.

2.6.2.3. History of EE in Zimbabwe

Zimbabwe developed its EE policy through a multi-stakeholder consultative approach in 2000 and 2001 (Chimbodza, 2004). Shava (2003) states that in secondary and tertiary education, most EE is undertaken in the context of carrier subjects such as Natural Science (NS), where there is a focus on the biophysical aspect of the environment. In Zimbabwe, the presidential inquiry into education and training in 1999 recommended the integration of EE into the school curriculum (Mukoni, 2013). An important milestone of EE includes the National environmental policy development (Mukoni, 2013).

2.6.3. Education system of South Africa

According to the DoE (2002), the education system of SA is split between two governmental departments, namely the Department of Basic Education (DBE) and the Department of Higher Education and Training (DHET).

1. The DBE is responsible for:

   Independent and public schools ranging from grade one to twelve. Grades RR and R also fall within this department. The curriculum used is NSC, however some learners end up leaving school before reaching grade twelve, who are then regarded as school drop outs (DoE, 2002)

2. The DHET is responsible for:

   Further Education and Training Colleges (FET). The DHET runs 50 public colleges and accredited 491 private colleges and universities in January 2012. Previously and currently, the purpose of education is to format identity. Education has always been a political tool which politicians use to pursue support (Msila, 2007). Political groups have a major impact on the education system and is a major force that drives the education of todays' youth, and the researcher is of the opinion that it has formed and deformed the country's youth. In SA societies were divided through the apartheid education system, in which certain classes of ethnicity were provided with better educational resources (Msila, 2007).

During the apartheid era, learners were divided according to their race and the social groups in which they belonged. Therefore, education was used to separate Caucasian, African, Indian and coloured people. The standards of the schools that were built years ago were built according to the race of the learners that were accommodated by that school. In the schools of white learners, the schools were state funded whereas other schools were not, especially the ones that were accommodating black people. There was also a lack of teaching aids and resources in those schools, while white learners benefitted a lot from the state.

According to Apple and Jungck (1990), educators in these schools were unconsciously or consciously involved in the political act and education was not a neutral enterprise. Education is largely influenced by the economy of the country, the communities surrounding the schools, the culture of the communities

and the political environment, even outside of the classrooms. Therefore, schools depend on the economic status of the country and the community around it and learners ought to respect the values and culture of their community.

The educational transformation in SA in the early 1990's overhauled the old apartheid education system (Msila, 2007:147). During apartheid, education started from missionaries which was derived as Missionary education and Afrikaner nationalist education and apartheid. This history of education gave birth to the introduction of Outcomes Based Education (OBE), earlier referred to as the curriculum 2005 (C-2005), which requested cooperation among various stakeholders and later changed to the National Curriculum Statements (NCS) with the application of Curriculum Assessment Policy Statement (CAPS). EE was initiated through the school curriculum in 1990. Even during the times of Apartheid in SA, EE was included in the school curriculum through agricultural learning, where people were equipped to be able to work on the farms. Now, EE is included in all learning areas by topics related to the environment (Mokhele, 2011).

2.6.4. South African History of Environmental Education

According to Peden (2009), EE in SA has undergone a series of paradigm shifts. Before 1994 it was the domain of conservation bodies and non-governmental organisations and was neglected in formal education (Peden, 2009). Its focus was on the natural world only, with social and political issues generally excluded (Peden, 2009). Peden (2009) mentions that environmental education moved into the formal school curriculum as a whole, and not as a single subject.

According to earlier views on EE, the bio-physical dimension of the environment was synonymous with the "environment" (Mosidi, 1999). Mosidi (1999) stated that the first attempt to include EE in formal education resulted from the process that led to the drafting and passing of the White Paper on Environmental Education in 1989. Mosidi (1999) asserts that the White Paper proposed and outlined goals and objectives in line with the guidelines adopted in Stockholm (1972), Belgrade (1975) and Tbilisi (1977).

Mosidi (1999) speculates that in an attempt to encourage broad participation and to infuse EE in formal education, the Environmental Education Policy Initiative (EEPI), a joint project between the EE community and the Department of Environmental Affairs, was launched in 1993. It was at the Dikhololo conference in 1993, with its broad stakeholder representation, that EEPI developed clear guidelines on how to integrate EE in formal schooling in SA (Mosidi, 1999). According to Irwin (2007), the first Environmental Education Association in Southern Africa's (EEASA) "national" workshop on EE in Umngeni Valley was attended by 100 people from all over South Africa as well as Zimbabwe, Namibia and Swaziland. The second national workshop was held in Swaziland and was attended by 250 people and the third was held in Mmabatho, in what is now the North West province, and was attended by over 400 individuals (Irwin, 2007).

The 1992 Howick conference/workshop started the lobbying and policy-involvement balls rolling, while the EEPI was the focus of concern in Bloemfontein a year later (Irwin, 2007). Le grange (2002) states that in 1992, the EEPI was started as a more inclusive process of gathering and developing EE policy options for formal education in SA. The Wildlife and Environmental Society of SA published a handbook titled "Eco-schools international programme", which involves 7 steps that each school should follow to become an eco-school (Braus & Wood, 1993). The aim of this project was to raise environmental awareness of learners and the community as a whole (Braus & Wood, 1993). EEASAs first truly international conference/workshop was held at Kearsney College in Natal in 1995, attracting delegates from all over the world (Irwin, 2007). According to Irwin (2007), the 1997 conference saw the formal establishment of the Southern Africa Development Community (SADC) Regional Environmental Education Programme and the "Industry and Business EE Forum". The researcher believes that EE has made great contributions in schools as this is where learners start learning about nature while they interact with it. The contribution of EE in schools is discussed in the following section.

2.7. CONTRIBUTION OF EE IN SCHOOLS

According to Braus and Woods (1993), the aim of EE is to improve the lives of people by providing them with the necessary skills which will empower them to prevent and solve ecological issues. EE can assist individuals to have access to knowledge, skills Et cetera, that they need to manage and sustain Earthly resources (Braus & Wood, 1993). Adebayo (2014) further corroborates that the contribution of EE in schools is to create awareness towards teachers, learners and the community at large, help sustain the Earth's resources, mitigate environmental crises, take action and invigorate the public school system. These are explained in-depth below:

2.7.1. Initiate awareness

Adebayo (2014) mentions that due to ignorance and indifference massive harm can be done to the environment, upon which our lives and wellbeing depend. This makes EE a vital component on Earth for the present generation and future generations to ensure the survival and well-being of the planet (Adebayo, 2014). This can be better achieved by raising awareness towards teachers and learners through the successful integration of EE in schools and creating EE programs by teachers to prevent environmental crises and coming up with solutions to the environmental issues that have already taken course. EE can contribute by raising awareness towards the environmental problems facing the globe.

A lot of programmes should be developed to raise awareness on environmental crises as a result of human behaviour. As the population is increasing, having environmentally illiterate citizens can lead to a great impact on our environment. For this reason, awareness must be raised throughout communities, which starts at school since that is where learner's lives are influenced because they spend a majority of their time.

2.7.2. Sustaining Earthly resources

Adebayo (2014) states that EE is essential to sustain the natural resources of planet Earth. So much damage to the environment can be done if people are not taught about their environment. Human beings are completely dependent on the

natural resources which come from their environment. Misuse of these natural resources can result in great disasters affecting the entire Earth and individual human lives. Therefore, EE can ensure that the natural endowment of the Earth is well maintained and utilised in a sustainable manner (Adebayo, 2014). The misuse of natural resources may result in land degradation, caused by the increasing production of goods and services, pollution, depletion of wetland, desertification and deforestation (Adebayo, 2014). Illiterate people contribute more to the degradation of land (Adebayo, 2014), but when citizens are aware of the consequences of their actions through EE they tend to be more cautious and better able to sustain the Earth's resources. EE helps to teach and thus prevent learners and society from misusing natural resources, as they are made aware of the implications of their actions.

2.7.2.1 Reduction of ecological crises and making a move

Demuzere et al (2014:108) mention ways of reducing the harmful effects of climate change on humankind through the process of "Green Urban Infrastructure" (GUI). Singh (2009) also came up with mitigation measures of environmental degradation such as; degradation of water resources, land degradation, degradation of fisheries, loss of biodiversity and climate change.

These measures can be classified as preventative and curative measures (Singh, 2009). Mitigation of environmental crises is possible through EE. This can be done through successfully teaching EE in classrooms as this is where a nation is moulded. Because learners are future leaders, equipping them with the skills to mitigate environmental crises and how they can take action through minimising and preventing these environmental problems will do much good and raise the standard of the countries' economy because the richness of a country greatly lies in the maintenance of its natural resources.

2.7.2.2. Elevation of state funded educational system

Adebayo (2014) states that the benefit and need for EE is overwhelming. The teachers teach learners ultimately spread knowledge to their parents, which enhances the awareness in their communities (Adebayo, 2014). Invigoration of

the public school system can be achieved through the successful integration of EE in schools and implementation of EE in classrooms' everyday teachings. Braus and Woods (1993) further state that one of the goals of an EE program is to help learners develop the ability to think, both critically and creatively. An EE program can do much to help empower learners to improve the quality of their lives and the lives of others (Braus & Woods, 1993). This empowerment can lead to an increased feeling of pride and self-respect (Braus & Woods, 1993).
According to Braus and Woods (1993), EE helps learners to understand the problems and the consequences of current behaviours and teaches alternatives. Adebayo (2014) asserts that EE makes people aware of world environmental crises like climate change, loss of biodiversity, water shortages and land degradation.

Kasimov, Malkhazova and Ramanova (2002) also corroborate that EE is also based on different approaches, namely the interdisciplinary approach and regional approach.

- **The Interdisciplinary Approach**

  Kasimov et al (2002) state that EE is problem focussed and interdisciplinary, it is de-limited in various learning areas. This approach offers different methods to solve ecological problems (Kasimov et al, 2002). The interdisciplinary approach is vital in preparing learners who will be occupying governmental, industrial and business positions (Kasimov et al, 2002). Kasimov et al (2002) further stipulate that the purpose of these positions is to identify and solve ecological issues such as contamination of water and air which have a negative impact in human life if it is not efficiently managed. This interdisciplinary approach is directed to the teaching of education of sustainability which steamed from EE.
  The purpose of this approach is to prepare learners at an early age before they take over any positions in their adulthood, how to cater for their environment and also how to identify, solve and manage environmental issues. It aims to teach how to effectively sustain the Earth's natural resources.

- **Regional Approach**

  Kasimov et al (2002) state that the aim of the regional institutions is to train experts in solving delicate environmental mitigation issues in local and regional areas. Kasimov et al (2002) further mention that learners are up-skilled in different specialisations depending of their plans for the future. Under the regional component, they can be trained under:

1. **General ecology:** this involves learning how the ecosystem functions and develop reduction managerial methods.
2. **Geo-ecology:** this involves learning about the interactions of the natural environment and the impacts of human activity.
3. **Nature management:** this involves problem solving that relates to the management of natural resources and sustainability.

It is believed that this approach will shape the economy of the country because it strongly relies on the surroundings. Therefore, it is important that learners are introduced to learning about their ecosystems, interactions between species, consequences of their actions and how to manage the environment at an early age.

According to Kasimov et al (2002), EE was developed for sustainability. Kasimov et al (2002) further mention that EE and education for sustainable development are aimed at:

1. Promoting ecological knowledge and its conditions.
2. Furnishing standards, recommendations and criteria on making decisions about environmental protection and presenting solutions while bearing in the mind economic, social and environmental problems.
3. Establishing economic development benefits in alliancing with ecology protection.
4. Promoting the vitality of the use of technology to provide intensive support to natural conservation and culture.

5. Establish managerial techniques at numerous levels.

As everything has its strengths and weaknesses, so too does EE have challenges and opportunities. Below the challenges and the opportunities are discussed.

2.8. CHALLENGES AND OPPORTUNITIES OF EE

Below the challenges and opportunities are discussed. The challenges of EE are all the things that hinder the effectiveness of EE in an individual life while the opportunities of EE include the beneficial exposure of learning EE.

2.8.1. Challenges of EE

According to Hudson (2001), ecological issues are very prominent to comprehend and evaluate. Ecological issues affect everyone across the planet.

1. EE has a challenge in expressing the complete modern ecological problems in a comprehensive and appealing manner (Hudson, 2001).
2. To ensure that EE plays a vital role in evaluating and explaining ecological problems and presenting solutions to those problems (Hudson, 2001).
3. There is a gap between what people are taught and what they actually comprehend concerning the ecological issues.
4. EE was attacked in America across the board, as they claimed that loss of biodiversity, climate change, and the threatening of aquatic life is not necessarily important to worry about (Hudson, 2001).
5. Learners are presented with learning strategies that mostly require them to use technology rather than direct interactions with nature (Hudson, 2001).
6. The challenge is to not to supply new information, but rather to promote interdependent opportunities that will encourage continued experiences and learning for outdoor experiences (Hudson, 2001).
7. EE should promote outdoor activities rather than teaching learners through online programmes which require them to sit in front of a computer and rob themselves of the opportunities to interact with nature (Hudson, 2001). This means that the curriculum should shift from an online experience to hands-

on activities, where learners benefit from the interacting with their peers and nature itself (Hudson, 2001).

8. Hudson (2001) further notes that the children of today now learn about nature on television more than they learn from practical experiences. This way of learning should not necessarily be criticised, as they offer exceptional teaching techniques for teaching individuals about nature such as; IMAX films, the Discovery Channel etc. (Hudson, 2001).

Below are some of the challenges based on observations as a teacher in one of the schools in KwaZulu Natal Province:

1. Challenges of EE are based on a lack of knowledge concerning the environment.
2. Learners do not have the confidence in their studies and may have hygienic and learning problems as well (Rahman, Halim, Ahmad and Soh, 2018).
3. Learners lack information regarding the environmental problems that are faced and therefore struggle in coming up with solutions to these problems.
4. In schools currently, outdoor exercises are not performed because teachers are only worried about covering the curriculum in classrooms.
5. Outdoor exercises are seen as a waste of time because learners see them as a time to play around and be disobedient towards their teachers. Learners are uncontrollable outside the classroom, and the researcher thinks this is because the education system is failing the teachers as disciplinary majors are perceived as being abusive.
6. The use of technology has taken too much time away from outdoor exercises because a lot of time is spent on online research rather than experimental and explorational learning.
7. Learners are no longer interested in first-hand exercises because they do not see how that will help them in improving their lives and their communities.
8. Another challenge of EE is the attitude of teachers and learners in schools, the researcher has observed that most teachers of today are more comfortable in teaching inside classrooms as opposed to outside since not everyone has an adventurous spirit.

This study has helped in revealing challenges in a wider context and suggesting ways to address these challenges in order to improve the teaching and learning of EE.

2.8.2. Opportunities of EE

The opportunities of EE draw from the knowledge acquired through conservation education and outdoor activities. According to Marcinkowski (2010):

1. Through EE people will gain the necessary skills required for the job market, in that way job opportunities will be presented to people.
2. Natural resources will be sustained through the learning of EE.
3. The economy will be improved as communities learn about recycling.
4. Due to EE, people have the opportunity to live in a healthy environment with less pollution, hence having a clean environment will prevent many illnesses.

2.9. ENVIRONMENTAL EDUCATION POLICY STATEMENT - THE SA CONSTITUTION

SA has numerous policy documentation which promotes EE. A few of them are discussed in this section. The DoE (1995: 18) mentions that the White paper on Values and Principles of Education and Training states that EE which involves versatile, unified and active methods to learning should be an imperative tool in all levels and education programmes in order to develop environmentally literate citizens in order make sure that all the SA citizens have a decent and quality life through sustainability. This policy underlines the significance of teaching EE at every level of education in SA.

The South African Constitution (1996: 6) ensures the right to an ecology that is not detrimental to the health of humans and their well-being and to a protected environment from contamination, environmental degradation etc. for the benefits of the current and future generations. Kimaryo (2011) mentions that as a result of democracy in South Africa, the constitution has recognised the importance of

ecology for the welfare of its residents. According to the National Climate Change Response White Paper (2011: 5), the climate problems that affect our world are real and alternative ways of production are required to solve these problems. These policies attest to the value of EE to SA.

2.10. LINK BETWEEN EE AND ESD

Education is a platform where people can be taught about their environment, social issues, political concerns and the economy. Without education, people would lack direction. Education has existed since time immemorial, as even though there was no formal education, children were taught about their culture, values of the communities and their responsibilities by their elders.

2.10.1. The link between education and SD

In a document published by UNESCO (2014:1) labelled as “SD begins with Education: How education can contribute to the proposed post-2015 goals”, it was stated that education is a basic right which contributes to the progression of all countries. Therefore, every parent requires knowledge about nutrition and health in order to successfully raise their children and provide the life which they deserve (UNESCO, 2014:1). To overcome challenges like poverty and climate change and to achieve SD in future, people need to be united and work together (UNESCO, 2014). EE teaches people about the environment and SD teaches people how to develop sustainable actions and highlights ways in which they can sustain their environment.

2.10.2. The link between EE and ESD

The links between these two terms are distinct, since both promote a change of behaviour and the attitudes of individuals towards the planet Earth. The recent development in EE and ESD is a reflection of the vitality of addressing overarching ecological issues (Hume & Barry, 2015). EE is closely associated with SD and this relationship can be explained in different ways (Sauve, 1996). According to Sauve (1996: 18), for some, SD is seen as the goal of EE: the term EE for SD (EEFSD) was then proposed. UNESCO (1992) proposed EE as one

among numerous thematic education tools that contribute to the overall ESD. Sauve (1996) further adds that EE implicitly includes ESD.

UNESCO (2005) states that ESD includes learning about how to make informed decisions and taking action that will bring balance and integration to the countries' economic future, ecology and communities (UNESCO, 2005). Pavlova (2011: 334) states that EE stopped being a main concern in the UN in responding to the ecological crisis and at the Thessaloniki conference organised by the UNESCO, the EE to ESD transition was emphasised (Pavlova, 2011). EE is used to teach or make people aware of their environment, while ESD is used to teach people how they can sustain their being and resources. With these two terms, the world can be a better place to live in as they both offer strategies and methods to be used in order to sustain current lives and the lives of the next generation.

ESD lies through the connection between people and their ecosystem. An ecosystem is a place where all living things or organisms interact and live. Below is a diagram showing the relationship between people and the ecosystem, labelled as Figure 4 and Figure 5 There are certain terms that are associated with ESD such as Education about SD, Education for SD and Education towards SD, as presented below. These terms are used in this study to provide a clear picture of the benefits of ESD in communities and schools for better learning of EE in classrooms.

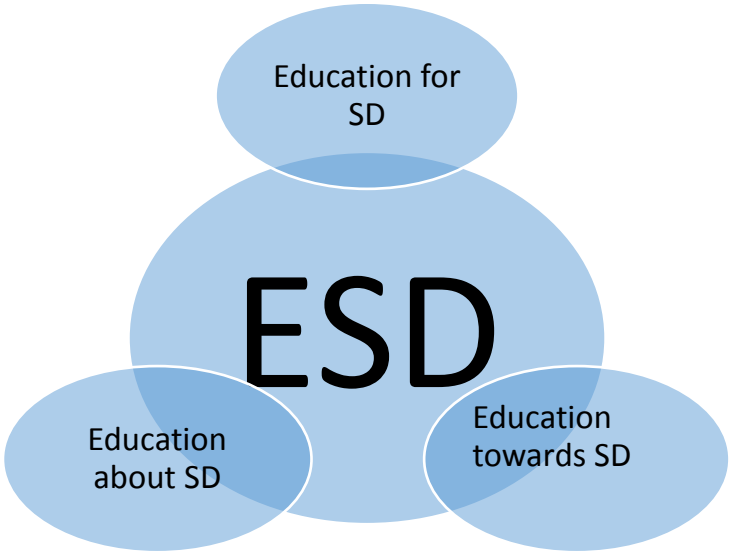

Figure: 4 Education for Sustainable Development model

2.10.3. Purpose of Education about, Education for and Education towards sustainable development

1. Education about SD

   According to UNEP (2003), education about sustainable development provides information by ensuring awareness from learners that they need to proactively protect the environment which they will inherit.

2. Education for SD

   Education for SD focusses on actions to be taken in order to change attitudes towards life and build awareness to sustain lifelong practices. This can be done through letting people know how they can sustain their environment for sustainable development and alert them of what may befall them if they fail to do so.

3. Education towards SD

   Education towards SD places an emphasis on information generation from taking critical actions and improving the lives of citizens. Therefore, changing policies and curriculum is critical and vital in order to maintain the environment.

ESD in schools through EE is governed by school values as well as economic, social, cultural and ecological sustainability. It is represented in a model labelled as Figure 5 below. The elements of ESD are discussed in this study as they will show the purpose of ESD and EE for effective learning and teaching of EE in schools and how it can improve the lives of individuals.

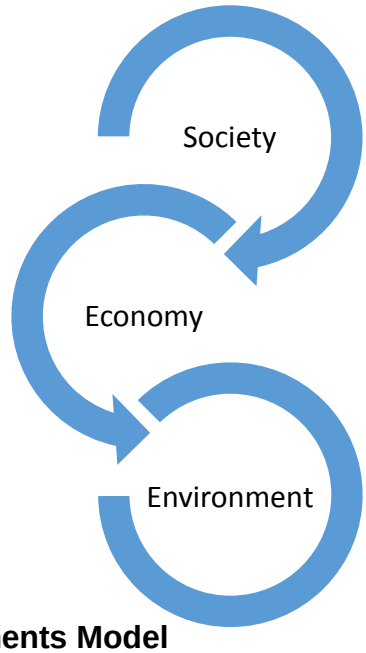

Figure: 5 ESD Elements Model

2.10.4. A connection between society, economy and environment

1. Society

Society is influenced by people who interact with and are around it. It is made up of the values, beliefs and the culture of the society. Therefore, society is associated with a respect for life and nature, mental and physical health, global justice, the rights of generations to come, diversity of values and culture (Laininen, Manninen & Tenhunen, 2006). This study relies on society as the participants are teachers and learners who are from the society itself and responsible for passing the information they have acquired to other members of their society.

2. Economy

The economy largely depends on the environment and society in order to be valuable. The mineral resources that improve and give rise to the economy of the country come directly from the environment and the people who process these mineral resources make up the local societies. This study recommends methods of sustaining the environment through educating the youth about the environment and on saving materials and

energy through environmental awareness campaigns that are investigated by this study such as resource reuse, the sharing and borrowing of products, sorting and recycling waste that can be of better use for the economy.

3. Environment

The environment is everything seen around us. It is made up of the animals, plants, and people within it. This study recommends individuals to be aware of environmental procurement, saving of materials, energy and water, encourage reusing, recycling and safe use of hazardous substances for sustainable development.

2.11 LITERATURE ON SIMILAR STUDIES AND GAPS TO BE FILLED BY THIS STUDY

A study carried out by Castelli (2004) sought to explore "Teacher Perceptions of the Impacts of EE on the Teaching Process and on Student Learning. This study was only meant for the schools around Mammoth Cave National Park which were involved in the Mammoth Cave National Park EE Partnership (Castelli, 2004: 37). Therefore, teachers from other schools were excluded and recommendations were not given on how effective integration of EE in the classroom can be achieved. This study did not explore the challenges of teachers and learners in teaching and learning EE nor did it recommend solutions or voice the perceptions of learners, as it merely focussed on teachers. This study focusses both on learners and teachers.

Another study undertaken by Velempini (2016), was presented as "The Integration of EE in the Secondary School Curriculum: A Case Study of a 10th Grade Junior Secondary School Curriculum in the Okavango Delta, Botswana. This study focussed on Botswana and did not take into account how the implementation and curriculum delivery agents (teachers) reflected in the curriculum processors' (learners) experiences on the ground. This study was only limited to the Botswana context, and was concerned about what knowledge

the people have concerning EE. Hence, this study is concerned about the behaviours of teachers and learners after acquiring that knowledge.
Rampedi (2001) undertook a study which investigated the “Criteria for a Model for the Integration of EE into the school curriculum of the Northern Province”. This study was limited to this province and was more interested in teachers and had no room for learners to share their views. It also did not clearly state the purpose of the study and the research problem. This study, however, explores how learners as well as teachers perceive the integration of EE, and does not merely focus on teachers alone.

Another study was performed by Zwelibanzi (2016), presented as “An investigation into issues and challenges in implementing EE in special schools in SA”. The main focus of this study was on specialist schools and the challenges face by teachers in specialist schools in implementing EE in the curriculum. This study differs from the one performed by Zwelibanzi’s study as it focuses on secondary schools.

Another study which was undertaken by Riegerova (2011) was also reviewed, “EE in English lessons”. The above study did not spell out the rationale of the study or what exactly it aims to research. This study included learners as there were activities directed and accomplished by learners, however it did not address their challenges in learning EE.

This study gives recommendations on how EE can be effectively delineated in the classroom, and therefore can assist teachers in developing strategies which will enhance participation and action-based activities to sustain the environment in schools around KZN. It also highlights the challenges faced by learners when learning EE and recommends how these challenges can be addressed. This study gives possible solutions to the challenges faced by teachers and recommends ways in which the education system across the province can meet the teachers and learners’ challenges so that they can be addressed in the learning and teaching of EE.

2.12. INTEGRATION OF EE INTO TEACHING AND LEARNING

The integrative approach in teaching and learning is based on both practicality and philosophy. It is generally an approach which purposefully draws together knowledge, skills, attitudes and values from within or across subject areas to develop a more powerful understanding and linkages of key areas (Mwendwa, 2017). Across curriculum approach refers to the integration of content and skills into existing courses in a manner so as to focus on that content without jeopardising the integrity of the courses themselves (Verma & Dhull, 2017).

According to this study the integration of EE involves the knowledge of other subject in connection to EE to ensure that the knowledge of EE is expanded from one subject to another. Learners in this case, can acquire environmental knowledge and skills across all subjects curriculum. However, it has been revealed that in the study of (Velempini, 2016) that, the integration of EE in other studies is compromised because of the time allocated to each subject.

2.13. THEORETICAL FRAMEWORK

A theory that blends with the aim of this study is Social Learning Theory, theorised by Albert Bandura in 1973, as well as Social Constructivism Theory which was theorised by Lev Vygotsky in 1978. Social Learning Theory encompasses the terms “behaviour and observation”, this is a learning method/style for learning that is successfully used for teaching and learning in EE, as learners view a teacher as a role model they have to observe and learn behaviour from. In this study, Social learning theory will highlight possible ways that learners understand EE when they view teachers as role models, and is utilised even though the researcher is of the opinion that EE has more to do with exploratory learning, as learners need to explore the environment on their own.

Since EE has been initiated in all learning areas such as Natural Sciences (NS), Social Sciences (SS), Life Orientation (LO), and Technology (TECH) and so on, it is therefore a social context. Everyone interacts with the environment in a certain way. EE is transmitted from a school setting to the community, therefore

it is vital that learners are taught EE in school to minimise and prevent environmental problems created by human being's hazardous behaviour. Nabavi (2012) states that in the learning theories, the environment is seen as the driving force for major developments. Muro and Jeffrey (2008) further state that SLT has been long cited as a vital tool for sustainability and to promote behavioural change. Bandura (1978) speculates that this theory is largely based on the perception that everyone learns through the interactions between living and non-living organisms in the biosphere. In that way people then develop the same behaviour through observing other people (Bandura, 1978).

Nabavi (2012) states that people can assimilate, imitate and produce ecologically-minded people if the behaviour they have observed involve rewards. According to Bandura (1997), imitation is when an observed action is reproduced. Nabavi states that SLT over the years has been recognised as the most influential learning theory. Muro and Jeffrey (2008) accentuate that SLT has also been referred to as a bridging theory between behavioural and cognitive learning theories as they include attention, motivation and memory. In this regard, Bandura (1978) states that not all learning occurs through direct reinforcement. He then added upon his theory that people also acquire new knowledge through observing the behaviour of others (Bandura, 1978).

Bandura (1978) further mentions that there are general principles in association with this theory. Through imitation, observation and modelling, people learn from one another. According to Nabavi (2012), based on these general principles, learning can occur without a change of behaviour. There are also three concepts that are associated with social learning theory, namely modelling, intrinsic reinforcement and observation learning (Bandura, 1978). These concepts are discussed below:

2.12.1. Modelling

Models are people that are observed and the process of learning from them is called modelling (Neuman, 2007). Bandura (1978) stated that imitation and behaviour modelling can only occur when the person observed is positively able

to produce the desired outcomes. Nabavi (2012) further states that it has been confirmed by other previous studies that most behaviours are learned through modelling. For example, learners may be bullies because they have observed a violent model. Moral behaviour and thinking is greatly influenced by modelling and observation (Nabavi, 2012). In this study teachers are seen as the models because learners observe and copy the behaviour of teachers in and around their environment. If teachers throw litter around the school facility's grounds, the learners they teach will adopt the same behaviour. Therefore this study helps to facilitate teachers as models around their learners and suggests possible ways to enhance effective teaching of EE in the classrooms.

Bandura (1978) came up with four important conditions that are necessary for the modelling process. When these steps are carefully followed, any individual can successfully learn from the behaviour of someone else. These conditions are shown briefly in figure 6.

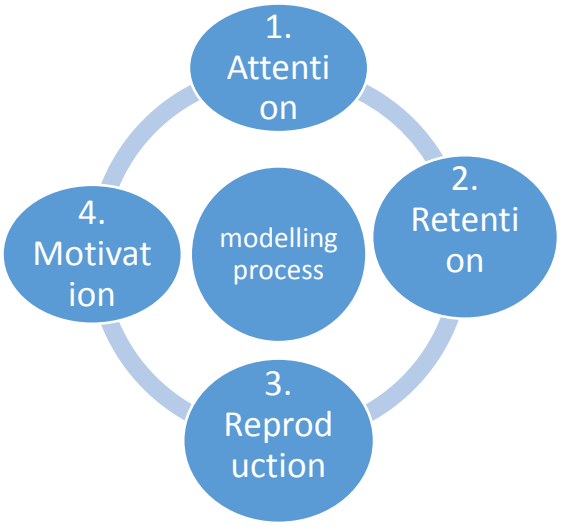

Figure 6: conditions, which are needed in modelling process

2.12.2. Conditions necessary for the process of modelling

1. Attention

It is crucial for an individual to pay attention to a demonstrated model.

(Bandura, 1978). Teachers must ensure they always introduce new things, present their lessons differently than the day before or change their EE teaching styles to enhance active participation of learners and to capture learner's attention. This study explores different methods and strategies that can be used to grab learners' attention for effective learning and teaching of EE in classrooms.

1. Retention

The person observing must have the ability to remember the observed behaviour (Nabavi, 2012). This can be increased through the rehearsal technique (Bandura, 1978). Retention can be done through revisions and repetition of the same behaviour presented by the model and encouraged until the behaviour is perfected. Certain methods are recommended by this study to remind learners of how to perceive the environment through repetition of lessons or doing exercises that will require them to relate to previous knowledge.

3. Reproduction

In this condition the behaviour demonstrated by the model is replicated (Nabavi, 2012). This means that the person observing the behaviour must be able to replicate the behaviour which could be a challenge to a learner who has not matured or is not ready for development (Bandura, 1978). Learners will need to display the behaviour they have learnt from the model, for example, if a teachers has demonstrated discarding waste materials in the classroom, the learners must show the same actions towards waste material. If the teacher has demonstrated the action of recycling, the learners must also recycle everything that's is recyclable, such paper, glass and so on. This study helps in suggesting activities that can be carried out by teachers or stakeholders to encourage learners to do the same in their environment.

4. Motivation

Motivation is one of the most important ingredients for the occurrence of modelling (Bandura, 1978). Learners need to be motivated in order to feel a need to demonstrate what they have already learned. Different people will possess the same behaviour in a different way depending on the four conditions. Learners' good behaviour must be motivated so that good behaviour may be repeated, while at the same time reinforcement and punishment play an important role in motivation. Therefore, good behaviour needs to be reinforced through the issuing of rewards, which can be anything, and bad behaviour must be punished in order to prevent the behaviour from being repeated. Teachers must ensure that they use reinforcement and punishment when motivating learners in EE classrooms. This study recommends methods of motivating learners to care for their environment and obtain effective learning of EE in schools.

2.12.3 Observational Learning

According to Nabavi (2012), the Bobo Doll experiment was an experiment run by Bandura in 1961 and ended up being known all over the world. The purpose of this experiment was to learn behavioural patterns in small pieces by SLT and the behaviours demonstrated by models had to be learned by people in order to shape their own actions. The experiment has helped in changing the outcomes of today's psychology and the focus on philosophical psychology from behaviour to cognition (Nabavi, 2012).

This experimentation is celebrated and widely recognised by the psychological community (Neuman, 2007). This experiment was vital because it proved that not all behaviour is reinforced but can be learned from modelling factors, in this case; the children were not encouraged to beat the doll, but they imitated what they had observed from the model (Nabavi, 2012). This event was then named by Bandura as Observational Learning, because people learn by observing and paying attention to the model, retaining what they observed, reciprocating the observed behaviour and through being motivated to produce the same behaviour (Bandura, 1978). Nabavi (2012) further mentions that it was demonstrated that learning can happen through imitation of behaviours which have been observed

from other individuals, and three basic models were identified in conjunction with this statement, stated below;

Learning through observation:

1. **A live model:** this is a model which includes a demonstration acted by someone else.
2. **A verbal instructional model:** this model gives an explanation of an act.
3. **A symbolic model:** this model acts a behaviour, and can be from a book, television or from a film.

This study will highlight how learners perceive EE through observational learning. Bandura stated that learners learn better when they observe a behaviour and then imitate it. Therefore, if teachers were to treat their environment in a sensible way, learners are also going to treat their environment cautiously. This study highlights what exactly the learners are observing from the elders of their communities and how that impacts their behaviour.

2.12.4. Intrinsic Reinforcement

According to Nabavi (2012), another form of learning is one which utilises internal rewards which include satisfaction, pride and fulfilment in accomplishing a task. Muro and Jeffrey (2008), who are supported by Bandura's social learning theory concepts, state that internal reward learning relies on internal thoughts and builds a connection between learning and cognitive theory (Nabavi, 2012). Bandura (1986) believes that intrinsic reinforcement is as important as external and ecological reinforcement, as they all influence learning and behaviour differently. As this study portends to research the perception of teachers and learners towards the integration of EE in classrooms, it will reveal how intrinsic reinforcement plays a major role in the successful teaching of EE and how this impacts schools, societies and the entire globe.

However, Social Constructivism theory is more concerned with the importance of culture and context in understanding what occurs in society and constructing knowledge based on this understanding (Vygotsky, 1978). On the same note,

Amineh and Asl (2015) state that social constructivism is a theory of knowledge in sociology and communication theory that examines the knowledge and understanding of the world that is developed jointly by individuals. This theory assumes that understanding, significance, and meaning are developed in coordination with other human beings (Vygotsky, 1978). An assumption of social constructivism relies on reality, knowledge and learning:

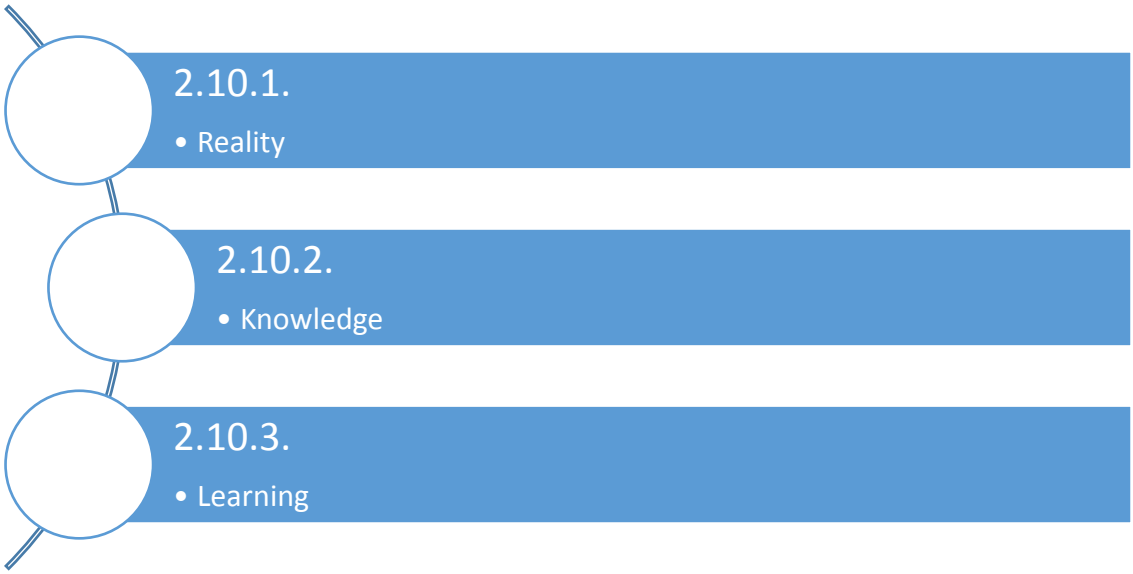

FIGURE 7: Details of the assumption of social constructivism

In the above figure, it is shown that social constructivism is based on specific assumptions about reality, knowledge and learning (Vygotsky, 1978). To understand and apply models of instruction that are rooted in the perspectives of social constructivists, it is important to know the premises which underlie them (Vygotsky, 1978).

Reality

Social constructivists believe that reality is constructed through human activity. Members of a society together invent the properties of the world. For a social constructivist, reality cannot be discovered: it does not exist prior to its social invention (Vygotsky, 1978). In this study, reality is seen as the educational setting in which teaching and learning takes place, and the activities of teachers and learners which facilitates learning and teaching of EE in schools.

Knowledge

To social constructivists, knowledge is a human product, and is socially and culturally constructed. Individuals create meaning through their interactions with each other and with the environment in which they live (Vygotsky, 1978). In this study it is believed that knowledge is constructed through the interactions of teachers and learners, therefore learners learn from the behaviour of teachers as well as from their peers.

Learning

Social constructivists view learning as a social process. It does not take place only within an individual, nor is it a passive development of behaviours that are shaped by external forces. Meaningful learning occurs when individuals are engaged in social activities (Vygotsky, 1978). This study highlights, through this theory, that learning is influenced by other individuals who are interact with, and for learning to be meaningful, learners need to be engaged with environmental activities like being involved in environmental clubs, competitions and environmental assessments.

This study has employed Bandura's (1971) social learning theory and Vygotsky's (1978) social constructivism theor, because it is believed by the researcher that learners learn through observing the behaviour of their role models, which in this study were teachers. They were viewed as models and learners thus imitate the same behaviour. On the same note, while learners are observing their teachers, these learners can sometimes learn from each other and their interactions with other learners and their teachers.

2.13. SUMMARY

This chapter maps how EE has evolved and developed through recent years into education for sustainable development. It also highlights the environmental problems that are still causing havoc in communities and the challenges of EE in schools throughout the globe. This chapter also discusses conferences and workshops that were held in support of EE and the support of educators and learners. These declarations and workshops have shaped todays EE in schools

and the implementation of EE in the school curriculum. This chapter also highlights the aims and strengths of EE in schools and community surroundings and how this can have a positive influence on the economy as a whole, as every individual life is greatly influenced by their environment.

Therefore, EE plays a vital role in ensuring healthy and well-educated citizens focussed on maintaining their environment. It also mentions the aims, purpose, objectives and goals of EE that were discussed in these conferences which every teacher must be aware of. The diagrams of ESD, SLT modelling and social constructivism theory assumptions have been presented to provide a clear insight into EE. It also highlights gaps in similar studies done by other scholars and how this study will fill those gaps. The theoretical framework of this study attempts to support the aim of the study to recommend methods of successful integration of EE in classrooms. It highlights how teachers and learners perceive their environment and how they are taught EE in classrooms.

CHAPTER 3
RESEARCH METHODOLOGY

3.1. INTRODUCTION

This chapter focusses on the research method and the research design used by this study to answer the research questions posed by the researcher. This chapter further discusses how participants were selected, how the information was gathered and how it was analysed.

This study explores the perceptions of teachers and learners towards the integration of EE in classrooms. The Social Learning Theory (SLT) was adopted for the purpose of addressing the challenges of teachers. The purpose of this research is to explore how teachers meet the EE curriculum needs of the learners in order to provide effective teaching and learning of EE and for learners to gain adequate knowledge of EE.

3.2. RESEARCH METHODOLOGY

The word “research methodology” is made up of two definite words, namely research and methodology (Williams, 2007). Igwenagu (2016) states that research is the process to quench humanity’s pursuit to comprehend their surroundings. According to the researcher’s own understanding, research is an investigation undertaken for a purpose to learn about something or to get new information about something based on experiences. Kumar (2011) states that research is a way of thinking, examining, understanding and formulating principles which govern and guide a study.

Methodology is a system that is used to analyse the techniques applied to a field of study (Igwenagu, 2016). Methodology refers to different strategies used to gather, organise and analyse information (Pilot & Hungler, 2004). Methodology is also seen as techniques used to discover something new (Mouton, 1996). According to this study, methodology refers to all procedures adopted for the successful accomplishing of this study.

A research methodology is the process of all necessary steps that need to be followed to complete a research project (Clarke, 2005). Denzin and Lincoln (2005) state that a research methodology is dependent on the questions and the topic of the research. MacMillan and Schumacher (2010) add that a research methodology is a set of all arranged methods that are to be used in a study. This study has employed a qualitative research methodology. Qualitative research methodology is associated with the experiences of people in a presented phenomenon (Yin, 2014).

3.3. RESEARCH PARADIGM

Kivunja and Kuyini (2017) state that a research paradigm relies on the personal beliefs of the researcher. This study's research paradigm is focussed on the perspective individuals have on the teaching and learning of EE. In order to understand this, an interpretivist paradigm is employed (Kivunja & Kuyini, 2017). It has been stated by (Avermann & Mallozzi, 2010) that interepretivism paradigm deals with the interpretation of people's worldwide view and experiences. Interpretivism paradigm involves observations and interpretation, therefore when observing data is collected and then interpret the collected information to make meaning.Through an interpretivist paradigm data has been gathered from the phenomenon site through observations, face-to-face interviews and focus groups to better understand the experiences of the sample group and interpret their experiences according to the themes that ermeged.

Shah and Al-Bargi (2013) state that a research paradigm is a process which gives guidance on how to discover the truth about the specific nature of a subject. They also describe the interpretivist paradigm as a process of interpreting and understanding human nature and their social reality (Shah & Al-Bargi, 2013). There is more than one type of research paradigm but in this research only two types of research paradigms, namely, ontology and epistemology, are focussed on. Ontology, as described by Scales (2013), is an ideology which is connected with the existence of things. The ontology of this study relies on studying whether ecological problems exist, and it becomes easier to facilitate ideas of how these problems can be mitigated or rather to question the existence of the environment

and its parts (Scales, 2013). Scales (2013) further states that ontology is only concerned with how the things existing in the world are categorised. Objectivist ontology was adopted by this study as learners and teachers are aware that the environment and the worlds' ecological issues are real and whether or not they are comprehended, they exist and need to be dealt with accordingly.

Epistemology on the other hand, is the study of how knowledge about something is acquired (Scales, 2013). It studies how people come to know about something. The epistemology of this study lies in how teachers and learners acquire EE knowledge and how they perceive the knowledge they have gained in order to help solve ecological issues facing the world. This study has adopted a positivist epistemology position because the researcher focusses on searching for the truth and ensures that the data collected is not affected by personal bias.

The ontology and epistemology of this study have stemmed from the researchers' personal beliefs, whereupon they view the world as the environment itself, and believe that the world does not exist in isolation from the environment. Without knowledge, the environment cannot be maintained and sustained accordingly.

3.4. RESEARCH APPROACH

The research approach is a pattern of meaning based on the data collected. The researcher needs to ensure that the research approach chosen is flexible in order to collect and analyse data effectively (Leedy & Ormord, 2013). A qualitative approach was chosen for this study.

3.4.1. Qualitative Approach

Leedy and Ormord (2013) state that a qualitative approach focusses on cases which take place in natural environments occurring in the real world. According to Langos (2014), qualitative research is usually appropriate for small samples. A qualitative method reveals how people who are in first-hand contact with the conditions or experiences define what they are facing (Kielmann, Cataldo & Seeley, 2012). It is stated by Hammarberg, Kirkman and de Lacey (2016) that in

qualitative research the objective stance is obsolete, the researcher is the instrument and subjects are classified as participants who may have a contribution on data analysis and interpretation. They further mentioned that qualitative methods are used to answer questions related to meaning, perspective and experience on the participant's standpoint (Hammarberg e al., 2016). A qualitative research locates the researcher in the world. Therefore, in this study, a qualitative approach was able to help the researcher to understand the participants in terms of their definitions of the world.

This approach allowed the researcher to specifically understand teachers and learners' views on the integration of EE in the classrooms of KZN. A qualitative approach has also helped the researcher to determine what teachers understand about EE regarding their teaching and learners of the focus area in the classrooms. This study is aimed at investigating how teachers and learners perceive the environment, therefore this investigation is carried out in a real life environment, which is a school environment, and is conducted on real people in a real life phenomena.

The qualitative methods in this study were used to reveal the perceptions of teachers and learners towards the integration of EE in the classroom, where focus group discussions amongst learners assisted in explaining how they perceive the integration, face-to-face inteviews were used to investigate teachers perceptions, this assisted in explaining ways in which EE can be improved. The integrity of this study was defended by the means of trustworthiness. The authencity of this study lies on the imperative data that was collected to capture the real-life experiences which were not identical. The details of data generation and management was transparent and explicit.

3.5. RESEARCH DESIGN

There are several qualitative research designs. A research design is a technique that is followed to conduct research, it determines how data is collected and where, and follows the research questions. McMillan and Schumacher (2010) state that a research design defines the process of how the research is

conducted and it explains where, when and on what conditions the data is collected. This study has followed a Case Study research design (Yin, 2014), which allows for detailed research into recent developments with regards to a real-life phenomenon. This investigation was carried out within the province of KZN and all participants were teachers and learners.

3.5.1. Multiple Case study design

The case study design allows for in-depth analysis of new and unclear phenomena while preserving the comprehensive and significant attributes of a specific real life phenomenon (Phelan, 2011). A case study method enables an investigator to intimately explore the data within a particular environment (Zainal, 2007). Rowley (2002:17) corroborates that case studies are good for modern events when relevant behaviour cannot be manipulated.

In a case study, events are studied in-depth in a given time (Leedy & Ormord, 2013) and the researcher collects extensive data on the individuals, programs or events on which the investigation is focussed (Leedy & Ormord, 2013). This study focusses on how teachers and learners perceive the learning and teaching of EE, how they perceive their own environment and what challenges they face in their day-to-day EE activities. This study is directed towards a group of teachers and learners who are teaching and learning Natural Sciences (NS) in Senior Phase (SP) classes. The case study design has assisted the researcher to answer the research questions of this study and allowed flexibility in data collection.

Starman (2013:29) states that the case study is one of the first research designs that was used in a qualitative research method and case study design is most likely to be used in qualitative methods when collecting data (Yazan, 2015). A multiple case study is made up of three or more case studies that have been explored. These case studies are guided by three secondary schools in KZN, with three Senior Phase NS teachers and 24 learners from grades 8 and 9.

Data was collected in three secondary schools. All of the schools were located within the South Coast of KZN. One of these schools was situated in one of the towns in South Coast while two were in the rural area. The enrolment of these schools were quite different because the first school situated in the town, labelled as School A, has an enrolment of approximately 1500 learners in total, with the phases taught in this school being the Senior and Further Education Training (FET) phases. Another school, which was located in the rural area, labelled as School B, has an enrolment of approximately 700 learners and teach only the Senior phase as it starts from Grade 7- 9, and the last one, labelled as School C, had approximately 730 learners in total and teaches both the Senior and FET phases.

3.6. DATA COLLECTION PROCEDURE

Information was collected from three teachers and 24 learners who served as the primary sources of data. This data was collected in a form of interviews, focus group interviews and observations. This data was collected directly from people who are involved with the teaching and learning of EE in the classroom and have had first encounters with the EE curriculum. Observations were conducted from schools as the researcher went to observe and received a chance to obtain information which was not shared by the participants.

The education system was and is still faced with serious concerns and the future of education is at stake as well as the planet's ecology as a whole. Teachers were given a chance to share their challenges through interviews and to suggest activities that could help improve the behaviour of learners towards the ecology. Learners were granted opportunities to share their views in relation to EE which could better enhance the teaching and learning of EE.

The data collection procedure stages that have been followed are listed below with clear descriptions (Kristjansson, Sigfusson, Sigfusdottir & Allegrante, 2013).

Stages for collection of data among teachers and learners in KZN secondary schools:

- **Stage one: obtain approval from the University for using people as sources of data:** obtaining approval from the College of Education Committee and obtaining an ethical clearance certificate from the board to get permission to conduct the study. This was done to ensure that the study was aligned with South African constitutional laws and to ensure that the study was beneficial to the chosen population and improved their knowledge. This needed to be done three to four months prior to the actual collection of data. This is necessary in a lot of countries for data collection from minors in schools (Kristjansson et al, 2013). Getting approval ensured that all procedures for people participating were followed and that parental and subject informed consent protocols were prepared, pilot tested and finalised.

- **Stage two: dictate suitable schools and prospective population:** this procedure was done one to two months before data was collected (Kristjansson et al, 2013). Data was collected from a sampled school, which involved the name, address of the school and the roll of the learners etc. This study only involved eight learners in one NS class per school from grades 8, as this study was mostly targeted towards this group. Prior to any information being collected, a letter of intention was sent to the school headmasters and the DBE gatekeeper to request permission to collect data in their schools. This very crucial information has to be kept by the university because it is a vital component for the planning of data collection processes (Kristjansson et al, 2013).

- **Stage three: orchestrate pre-study notice among the society:** One month prior to data collection, a brief letter was sent to the school headmasters with a short summary of the purpose of the study to be undertaken, which is not more than a page. This letter stated the reasons for this study and clearly stated that the language used was appropriate for each individual taking part in the study. The university's letterhead was in the letter.

- **Stage four: request participation of the school community (teachers and learners):** this was done three weeks before data is collected. A more in-depth letter was sent to the school headmasters in which they were requested to allow the collection of data in their school. This letter was in relation to the letter in stage three, however it contained more information. The same university letterhead was used and included all delicate information concerning the details of the researcher, the reasons for the study and how many people were going to be used as data sources. The headmasters were notified in this letter that they would have access to the information gathered in their schools.

- **Stage five: procure the headmasters' support:** one week after stage four was completed, the in-depth letter and a diplomatic phone call followed, whether the headmaster has responded or not, in order to give him/her an opportunity to ask questions they might have about certain aspects of the research. This proved to the headmaster how determined the researcher was to conduct the study.

- **Stage six: arrange interviews, focus group interviews and observation equipment for every school taking part:** information about the number of participants and which classes are taking part in the study should be ready at this stage. A file was prepared which had the necessary information about each school and the participants. This file documented every aspect of the school, the name etc. All interview questions were in place at this stage and were filed for each school one week before the collection of data. These questions were put in an envelope to avoid mixing and the confusion of information.

- **Stage seven: visiting each school:** this visit was necessary to take place four to five days prior to data collection to ensure that the researcher formally introduced herself to the participants and the school headmaster. The questions of the interviews and focus group interviews were discussed

prior in order to avoid confusing participants. The researcher believed that there is no harm in discussing questions as this is a study aimed at empowering learners and teachers.

- **Stage eight: distribution of consent forms to teachers and parents to read and sign on behalf of their children:** ensuring that consent forms were sent to parents three days prior to collection of data was vital because using an underage individual as a source of data without the consent of their parent is against the law. This letter was written in an appropriate language which parents were able to understand and clearly stated the reasons for this study. Parents were allowed to withdraw their children if they feel that the study would pose any threat to their children's life, however this was unlikely since these focus groups were conducted in school premises during school hours.

- **Stage nine: headmaster and participants reminder:** the headmaster was contacted a day before collecting data to remind him/her about the interviews and focus group interviews as well as to remind all of the people taking part in their school. This allowed the schools' headmaster to ensure that the location of the interviews and focus group interviews was set and appropriate for these interviews.

- **Stage ten: distribute appreciation letters to all participants involved in the study:** after the data collection process had been completed and finalised, within a period of two weeks the schools were provided with a letter of appreciation for their cooperation and help in making this study a success. The data was then transcribed and returned to participants one to two months after collecting the data from them to read and point out if any data was missing or misinterpreted. After two weeks, a phone call followed to check how participants have been after providing data.

Data collection procedures were useful because they guided the researcher on how to collect data and served as a reminder of the most important aspects of the research.

3.7. POPULATION AND SAMPLING

Krieger (2012) defines population as the people, a group, families and communities that are chosen to participate in a research study. Strydom and Venter (2002) see population as a group of people or an organisation about which the research problem is concerned. According to Smith and Smith (2000), population is a group of people or elements in which the research focusses upon and whichever findings are generalised for the entire group or people who belong to that group. Population is regarded as people who have the same characteristics that the researcher needs to generalise the findings of the study. Population can also be regarded as people who meet the criteria set by the researcher for his/her study.

The population chosen for this study was made up of 26 teachers and 1500 learners from School A, 15 teachers and 700 learners from School B and 18 teachers with 730 learners from School C. Cohen, Manion and Morrison (2012) state that a sample is part of a group that is used as a source of knowledge throughout the research. The selection of the sample takes into account the demographics of the participants, the research sites and the phenomenon under investigation (Check & Schutt, 2012). Gentle, Charles, Ploeg and McKibbon (2015) defines sampling as a process of choosing a part of the population to represent for specific reasons to determine the characteristics of the whole population. They further define sampling as the process of selecting specific sources from which data is collected to address the research objectives (Gentles et al., 2011).

Careful sampling in qualitative research requires less interviews and focus groups to provide data that can answer the research questions and meet the research objectives (Elmusharaf, 2012). There are different types of sampling, stated by Elmusharaf (2012) as follows:

- Convenience sampling: is defined as a group of people that are chosen to represent the population because they are close at hand, which is not randomly chosen and can be easily accessed.
- Snowball sampling: is when the research contacts a few people and asks them if they know anyone with the same qualities that the investigator is looking for to conduct research.
- Purposive sampling: is normally called judgemental, because the researcher initially decides to obtain data from a sample he/she thinks is appropriate to represent that population.

In this study the researcher has chosen a purposive sampling technique because three secondary schools, with three teachers (one teacher per school) and 24 learners (eight learners per school) were selected which represent the secondary schools of the province of KZN. Purposive sampling, as asserted by (Robinson, 2014), is the term typically employed in qualitative research. Palinkas, Horwitz, Green, Wisdom, Duan and Hoagwood (2013) state that purposive sampling is mostly used to identify and select cases which have rich information that is related to the interest of the phenomenon.

Etikkan, Musa and Alkassim (2016) mention that purposive sampling has different methods such as Maximum Variation Sampling, Homogeneous Sampling, Typical Case Sampling, Extreme/Deviant Case Sampling, Critical Case Sampling, Total Population Sampling and Expert Sampling. These purposive sampling methods place primary emphasis on saturation, i.e. obtaining a comprehensive understanding by continuing to investigate until no new substantive information is acquired (Etikan et al., 2016). According to this study, purposive sampling can be seen as a type of sampling which permits the researcher to select a case because it shows some characteristics in which he/she is interested. Purposive sampling is also done in a deliberate manner with some purpose or focus in mind.

3.8. DATA COLLECTION METHODS

When conducting a qualitative research study, there are primary methods of data collection, namely: observation, interviews with individuals (face-to-face) and focus group interviews. The data collection plan embraced numerous techniques to acquire data from the research sites. This study has made use of face-to-face interviews, focus group interviews and moderate or peripheral membership observation to gather data from the sources and to triangulate the results.

3.8.1. Focus Group (FG)

Focus groups are used to gather the views of different people at the same time (Krueger, 2014). It minimises the need to perform interviews separately. A focus groups entails assembling individuals from homogenous backgrounds and experiences to discuss a particular topic (Baral, Uprety & Lamichhane, 2016). These kinds of interviews allow participants to participate openly and interact with other participants on a specific topic.

Focus groups allow free participation among participants because they get a chance to share their beliefs, opinions and views among other people who may or may not share the same perceptions and sentiments and such interviews allow participants to propose solutions jointly. In a focus group, participants are given a topic of interest, then they discuss and share their opinions concerning it. This kind of interview is normally lead by the interviewer, which in this case is the researcher, to disallow deviation from the content or topic of interest being discussed. Scenarios posed to learners in the focus groups were carefully structured and planned and for these interviews 24 learners (eight learners per class) were selected from the three schools chosen.

Focus groups have been used because they would be suitable for interviewing learners, since they are more comfortable among their peers, and was not seen as formal because learners sometimes feel overwhelmed and scared in formal environments and thus end up not providing adequate information as required would they be isolated from other learners. The focus groups probe a lot of information in an immediate space. Freitas, Oliveira, Jenkins and Popjoy (1998) state that a focus group interview is an in-depth interview type that is

accomplished in a group, whose meeting relies and abides to the proposal, size, composition and interview process.

Focus groups have advantages and disadvantages that a researcher needs to bear in mind when indulging themselves in these interviews. Baral, Uprety and Lamichhane (2016) mention some advantages and disadvantages of focus group interviews as stipulated below:

3.8.1.1. Advantages of focus groups

The advantages of focus groups are discussed below:

- They are free and open among participants and result in generating new ideas which facilitate effective decision making.
- The expressions of participants, even if they are not shared verbally, provide insight and the researcher with more knowledge on the topic discussed.

Other researchers like Krueger (1994) and Morgan (1988) have mentioned some advantages and disadvantages of focus groups as stated below:

- These interviews are easy to conduct and provide highly accurate data.
- They provide opportunities for the collection of data when the group is interacting based on the research topic.
- They are a fast method for collecting data and supplying results, as people are interviewed individually, and the researcher is flexible in their approach and can add the sample size if need be.

3.8.1.2. Disadvantages of focus groups

The disadvantages of focus groups are as follows:

- Even though the researcher can control the group discussion, it is entirely dependent on his or her past experiences. If the researcher is

unexperienced, this can create a lot of problems when trying to control participants who are trying to take over the group.

- Other participants may feel uncomfortable with sharing sensitive ideas and their concerns in a group of people, and since the sample size of the group has to be between 8-12 participants, the information may not be enough in accordance with the conditions at hand because a lot of people may be excluded.
- The focus groups may influence people to act in an unnatural way and the participants may provide incorrect information which they may not agree with because they want to fit in the group they are with.

This study has overcome these disadvantages listed above by ensuring that the researcher obtains relevant skills by attending a Masters & Doctorate workshop and interacting with different professors and lecturers who lend assistance in teaching what is required for conducting this kind of interview as well as ensuring that the researcher is always on par with maintaining professionalism and control amongst the groups. The disadvantages are also overcome by ensuring that every participants' views and opinions are respected and valued, no participants are belittled or undermined during these interviews, and that is is communicated before the proceedings of these interviews that every response is valuable and appreciated, especially since the sample size of these groups are 8 learners per class. The researcher needs to ensure that every participant is comfortable during the interviews and that the information provided is accurate. The researcher will not influence the participants' responses, they must share exactly what they know and have experienced, and the data will be analysed accurately.

3.8.1.3. Characteristics of focus groups

Krueger (2002:1) mentioned that the characteristics of focus groups are as follows:

- Participants must be carefully selected. The sample size must be between 5-10 per group, similar types of people and repeatable groups must be used

and the environment must be comfortable. It is preferable for the participants to be seated in a circle and must be tape recorded.

- The moderator needs to possess the skills required for conducting group discussions, use prearranged questions and create a non-restrictive environment.
- They must be analysed systematically. All procedures to be verified and reported appropriately.

According to Freitas et al. (1993:2), the characteristics of focus groups are:

- Focus groups demand the involvement of people and a sequence of gatherings is crucial.
- The similarity of participants in their backgrounds and experiences based on the research focus, the qualitative data generated and that the discussions are focussed on the topic are all paramount to the purpose of the research.

Krueger (2002:3) states that the researcher needs to decide where using focus groups may be necessary for the study before engaging participants.

Morgan (1997) states that it is crucial to determine the group size. The level of involvement that every participant contributes plays a vital role in determining the size of the group. Therefore, when a participant shows less interest in the topic, it would not be easy to maintain active participation within the group (Morgan, 1997). According to Morgan (1984), focus groups are a qualitative method that bring different participants together to deliberate on a certain topic of mutual interest. Researchers can make use of the audio tapes and transcripts as a tool for gathering data produced by focus groups (Morgan, 1984). Focus groups are regarded as a qualitative method to collect intensive data (Dilshad & Latif, 2013). Anderson (1990) states that a focus group comprises of individuals whose focus is on discussing a topic given by a researcher.

According to this study, the researcher believes that focus groups are an instrument that is used to collect data from people who belong in one group, who shares the same experiences and ideas in a presented context and that focus groups are conducted with the focus or purpose of illuminating the views and beliefs of the participants, who are representing other people who share similar views on the topic presented to them to fulfil the aim of the study at hand. 24 learners were selected for the focus groups as a form of data collection for this study. The researcher has collected data from three secondary schools, three NS teachers and eight learners per class who were chosen for focus groups. Eight learners per class from each school were selected so that these groups would not be overcrowded and result in a disorganised focus group that is uncontrollable.

3.8.2. Interviews: face-to-face

According to DiCicco-Bloom and Crabtree (2006), qualitative interviews are classified in different ways such as structured, semi-structured and unstructured interviews. Interviews are used as a tool to extract lived knowledge from an interviewee (DiCicco-Bloom & Crabtree, 2006). Interviews allow participants to share their views without being intimidated or disturbed by other group members.

This study opted to use semi-structured interviews, which are performed face-to-face. The reason to conduct semi-structured interviews is because semi-structured interviews are flexible and allow for uninterrupted answers and issues to stem from using open-ended questions (Tod, 2006). Ryan, Coughlan and Cronin (2009) states that the flexibility of the semi-structured interview permits the researcher to follow an unstructured line of questioning and allows the interviewer to explore different issues presented by an interviewee.

The researcher opted to use face-to-face interviews because they offer the investigator an opportunity to interact and interpret non-verbal cues through observing facial expressions, eye contact and body language and it may improve how the interviewer comprehends what is being shared. It also allows the

interviewer to explore and probe hidden understanding and meanings (Ryan, Coughlan & Cronin, 2009: 310).

Batmanabane and Kfouri (2017) mention that there are advantages and disadvantages of using interviews. These are listed below.

3.8.2.1. Advantages of face-to-face interviews

An interview provides:

- Opportunities for feedback on unanswered questions.
- Opportunities for clarification, especially on areas where the participant was confused about a certain matter.
- An opportunity for the probing of complex answers that are most likely to provide clear data.
- They allow for personal connection rapport.

3.8.2.2. Disadvantages of face-to-face interviews

Interviews:

- Have a high cost in time and resources. They are also limited by geographic proximity, length, complexity and generally a high number of non-respondents.
- They lack anonymity since the interviewer sees and knows who they are interviewing.
- The interviewer normally uses his/her personal interviewing style.
- The interviewer needs to consider the cultures of the participants, even if it hinders the collection of data.

This study dealt with these disadvantages by acknowledging all of the ethical considerations when conducting this study. Even though the researcher knows the participants they are interviewing well, when reporting about the research responses the use of pseudonyms and codes was used in order to hide the identity of the participants. The researcher avoided using their personal

interviewing style, and instead followed interviewing processes which learners would be comfortable with. The researcher also needs to consider the participants' cultural groups to ensure that they did not cross any unspoken barriers of the participants' communities.

According to this study, the researcher views face-to-face interviews as an integral tool for gathering qualitative data, as the interview is a one-on-one conversation between an interviewer and interviewee. Interviews allow the researcher to gather information which the respondent may have withheld because they were not comfortable to share it amongst other people. This kind of instrument gives the researcher an opportunity to dig or probe deeper and to obtain more intensive information and knowledge of a subject matter because enough time is given to a respondent and less pressure is presented to them. Three NS teachers were selected for the face-to-face interviews from three different secondary schools (one teacher per school). It was decided to use only three NS teachers so that enough time could be allocated to them for interviews, because having a larger sample size can be challenging since every participant needs to present themselves freely without being intimidated by other participants so that they can share their views and experiences without worrying of being rushed to finish because of time.

3.8.3. OBSERVATION

Goddall and Odessey (2015) accentuate that observation is an essential component for any data collection method. Through observation, the researcher observes within a specific research field. Jamshed (2014) states that observation is a qualitative method which not only includes the observation of participants, but also covers ethnography and research work. The result of observations must be accurate, objective, clear, and practically useful for generalisation (Cuka, Kruczek & Szromek, 2015: 5).

Kawulich (2012) sees observation as a useful tool used regularly to collect data by teacher researchers in the classrooms. Marshall and Rossman (1989), cited by Kawulich (2012), state that observation is regarded as the systematic account

of behaviours, artefacts and events of the social environment. Schensul, Schensul and LeCompte (1999) state that observations are used to assist an investigator in identifying and guiding relationships with the respondents to learn human interactions in that setting and learn the way in which thing are prioritised and organised in the setting, to become known to the participants, to learn what is important to the people in that setting where the study is undertaken, to learn what constitutes appropriate questions, how to ask questions and learn which questions may help to answer the research questions given (Kawulich, 2015).

Baker (2006: 172) corroborates that observation needs the investigator to play different roles and apply several methods for data collection. Gorman and Clayton (2005) assert that observation includes recording all observed phenomena of behaviour systematically in a natural environment. Baker (2006) mentions that there are four roles of the researcher that are associated with observation, which are;

- Non-participation: the researcher observes from a different environment and is not present.
- Complete observer: the researcher is present, however they do not take part nor interact with participants in the scene.
- Observer as participant: the researcher is involved in the scene and is present in any form. The researcher can also observe and conduct short interviews to gather in-depth knowledge.
- Moderate or Peripheral Membership: the researcher can maintain a balance of being an observer as a participant and complete observer. The researcher interacts with participants and sometimes engages in their activities but does not take part in those activities.

The role which has helped to reach the full capacity of this study is the complete observer role, as this role has allowed the researcher to be present in the phenomenon and be able to gather data direct from the participants. It has also allowed participants to be free and not be overloaded and crowded by the researcher. It has allowed them to plan their activities and accomplish them

without being interrupted or pressurred and having the researcher add their own experiences.

3.8.3.1. Characteristics of Observation

Patrick (2018) has specified some characteristics of observation below:

- It focusses on communities and ethnic groups.
- It helps in understanding immediate impacts on events and aspects of everyday life.
- It helps in obtaining an inside view of reality.
- It focusses on people and the setting.

Patrick (2018) also mentions that observation has advantages and disadvantages which are discussed below.

3.8.3.2. The Advantages of Observation

- It is a useful component for developing a new product, developing a new market, improving the quality of a product and providing a foundation for better improvement of results.
- Observation permits the observer to gather more knowledge and understanding of the phenomenon setting.

3.8.3.3. Disadvantages of Observation

- The language barrier, where the researcher and participants speak different languages or some participants do not understand the language used by the researcher to communicate.
- The cultural barrier, where the researcher and participants originate from two different cultural groups and one party is not sensitive to the cultural norms of the other.

- There are risks involved, especially when the observer is present in the scene and the participants behave in an unacceptable manner.
- Unacceptable behaviour posed by participants under observation.

In this study, the observer had to overcome the disadvantages of observation by ensuring that there is no language barrier between the interviewee and the interviewer. The researcher ensured that the population chosen speaks the same language that the researcher speaks to avoid misunderstandings and the misinterpretation of data. The researcher is bound to be sensitive in every way possible to the cultural norms of the participants. The observer needs to avoid probing unnecessary information that can prove to be unacceptable to another human being. Participants are assured that this study will not pose any threat to them and is not conducted as an exposure tool, but rather a system to encourage curriculum developers and implementers to re-invent their strategies in integrating EE.

Observation can be used to study a different phenomenon, sustain the interrelationship of the situation and people, and preclude methodological problems, resources or ethics as well as a lack of knowledge about the topic (Patricks, 2018). Based on this study, the researcher views observation as an essential tool to gather data directly from sources, as this gives the researcher time to indulge in the same environment where participants are interacting and gives the researcher an opportunity to gather in-depth data which was not shared by participants by looking at situations and interpreting what the researcher has seen. Observations were conducted within the classrooms of three secondary school teachers as well as the school overall because each and every learner needs to show the same sense of responsibility towards their environment. Even learners that were not chosen for focus group interviews need to be observed so that they can be properly taught to take care of their environment.

3.9. DATA ANALYSIS AND INTERPRETATION

Flick (2013: 3) states that data analysis is a vital step in qualitative research. Polit and Beck (2008) define it as the process of distinguishing data into small and

manageable pieces in order to find the most meaningful answers associated with the research questions and objectives. The analysis of data provides the outcome of the study (Flick, 2013). The data collected through observation was analyse and interpreted according to the behavioural patterns that the participant's portrayed, the focus groups and interviews data was coded and grouped into themes and categories in order to answer the research question of the study. However, data analysis and interpretation is broadly explained in Chapter 4.

3.10. PILOT STUDY

Arain, Campbell, Cooper and Lancaster (2010) define a pilot study as the initial study that is used to assist in designing a complete larger study. A pilot study addresses several logistical problems (Simon, 2011). Simon (2011) further elaborates that the pilot study does not guarantee that the final study will be successful, but it raises the chances. Yin (2014), cited by Jasinski, Davis and Jones (2017), defines a pilot study as being formative and assists the investigator in developing relevant questions as well as to possibly provide conceptual clarification for the research design.

Miles (2013: 1) mentions the advantages of a pilot study as follows:

3.10.1. The advantages of the Pilot study

- It allows primary examining of the hypotheses which leads to testing more precise hypotheses in the main study. This may require the researcher to change, drop and develop new hypotheses.
- This will enrich the researcher with different ideas and ways in which to approach the study which he/she may not have foreseen before conducting the pilot study and these clues will lead to more clear results in the final study.
- It might allow deep checking of the arranged analytical and statistical methods by giving the researcher a chance to evaluate how they will use the data. This will assist the researcher in making changes where

necessary in the data collection methods and how he/she analyses data in the final research. They may then be able to make needed alterations in the data collection method and therefore analyse data in the main study more efficiently.

- It can help to prevent unforeseen issues because the researcher gets a chance to redesign parts of his/her research.
- A pilot study can save time and a great sum of money because many different research ideas can be promising but become unsuccessful when the research is actually done. The researcher is able to dictate whether he/she still needs to persist with the research or not.
- The investigator can use many different forms and then choose the ones that provide clear results for the final research project.

Before conducting a complete research project, a pilot study was conducted. The pilot study consisted of six participants. The participants included one NS teacher and five learners, which sums up to a total of six participants. The data collection methods employed for the pilot study were face-to-face interviews, a focus group and observation within the school the researcher is currently teaching at. The principal of school was alerted and he agreed. The School Governing Body (SGB) and the DoE official (District Manager) was contacted in writing and telephonically for permission.

The school is situated in one of the towns in the South Coast as well. The participants were purposively chosen from the school which the researcher teaches at, and the learners were of different genders (three girls and two boys) and races (two Africans, two Indians and one Coloured). They were chosen according to their ethnic groups to provide a balanced perspective of the school since these learners come from different communities. All of these participants gave consent for participation in the study through written consent, questions were adopted for the rationale of this study and most interview questions are similar to the questions of the final research project.

3.11. ETHICAL CONSIDERATIONS

In conducting this study, the researcher was aware of the ethical issues concerned. As Kvale and Brinkmann (2009) contend, interviews have a moral extent because they include social interactions and producing information concerning how human beings live. They also note that the three main ethical issues are informed consent, confidentiality and consequences (Kvale & Brinkmann, 2009).

3.11.1. Permission to conduct the study

An Ethical Clearance Certificate was applied for from the College of Education (CEDU) Committee (REC) at the University of South Africa (UNISA) to obtain permission to conduct this study because it is important to get permission from the people in charge. Letters were written to the gatekeepers at the Department of Education district and the schools in which data was collected.

3.11.2. Informed Consent from participants

It was ensured that participants were told that participation was voluntary. The researcher then issued all of the people taking part in this study with informed consent forms to sign after reading and understanding all of the requirements. All procedures of the research were discussed with the participants and they signed before they started sharing their information and experiences. Since learners are under the age of 18, they were required to take the forms home to their parents for them to read and sign on their behalf.

3.11.3. Anonymity and Confidentiality

Anonymity and confidentiality was assured within the forms and letters to the people who participated. Personal particulars of all participants was not shared during this study and pseudonyms and codes are used where necessary, e.g. T1 for Teacher 1, and the participants were not exposed to any harm during the research.

This research involves three teachers in three secondary schools in the province of KZN It is assumed that since the researcher also teaches at a secondary

school, ethical issues will not be an issue when gathering data from the other schools as they are familiar with the context. Therefore, all ethical issues have been taken into account in order to respect the dignity of the participants. It has also ensured that before the interviews were conducted with the participants, they were briefed about the nature and purpose of these interviews and the manner in which the researcher needed to record and transcribe their responses was described. It was also ensured that informed written consent was received and the researcher and guaranteed them of confidentiality in the reporting of the data and interviews.

3.12. TRUSTWORTHINESS OF THE STUDY

According to Punch (2009), the trustworthiness of qualitative findings includes triangulating different data sources and using member checking when gathering and writing up data obtained from participants. The researcher recorded all interviews conducted and arranged information to be verified by every person participating after an interview, and all interview data was transcribed in order to make sure that the information provided is correctly presented.

In the promotion of trustworthiness, all information and responses by participants were audio-recorded after obtaining permission from participants. Probing questions were essential to elicit open responses which provided clear and sufficient information regarding the subject matter.

3.13. SUMMARY

This chapter focussed on the research methodology. It discussed how the study was conducted and justified the use of the research approach chosen, which is a qualitative approach. It discussed the research design used, the use of a multiple case study, the data collection techniques used and justified why they were appropriate for this study. The following chapter focusses on the data presentation, analysis and interpretation.

CHAPTER 4
DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1. INTRODUCTION

This chapter addresses the presentation, analysis and interpretation of the qualitative data collected which will serve as the foundation for interpreting the results. This data was analysed using thematic analysis. Data was collected through the use of focus groups, face-to-face interviews and observations. The data was collected in three different schools. This chapter mainly addresses the following themes which emerged: perception on environmental exposure, practices in teaching environmental education (EE), influence of EE and challenges which hindered the teaching and learning process. This chapter focusses on pilot study findings, cases, data presentation and data analysis. The findings of this study answer these research questions:

- What are the teachers and learners' perceptions of EE?
- What are teachers' teaching practices used to effectively teach EE?
- How do learners perceive the learning and teaching of EE?
- How does the teaching of EE influence learner's behaviour?
- What challenges do teachers come across which hinder effective teaching of EE?

4.2. STRUCTURE OF THE CHAPTER

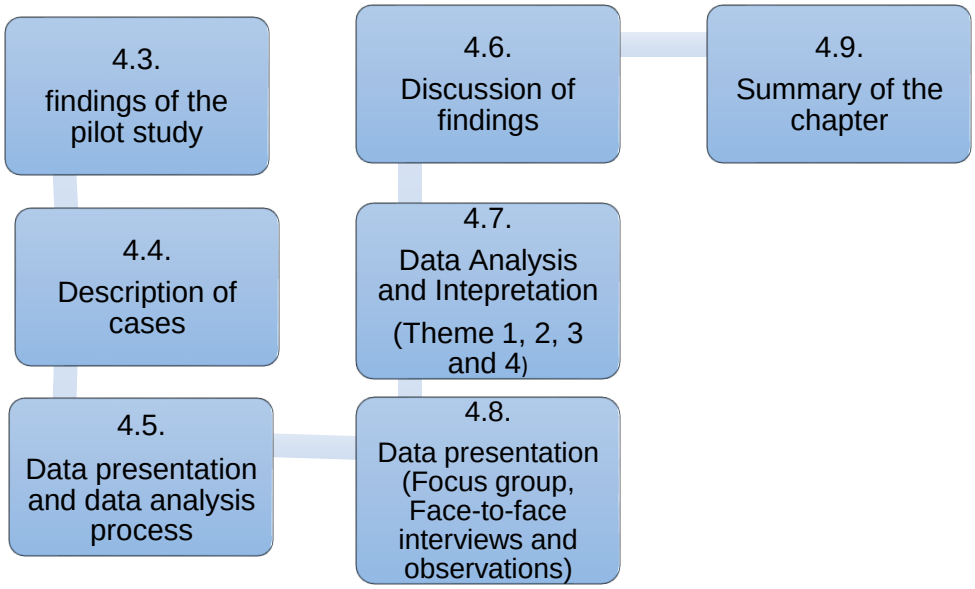

Figure 8: Structure of the chapter

4.3. FINDINGS OF THE PILOT STUDY

This section aims to outline how the pilot study was conducted. A pilot study is the first step which should be undertaken by every researcher for a successful research project, especially in the data collection phase, to determine the perceptions of teachers and learners in this research and whether the research techniques will assist to collect intensive data that is needed by the researcher.

The pilot study of this research is aligned with the research questions, the research methodology, design and instruments of this research study. The researcher used the same selection procedures and ethical considerations for the pilot study as the final research study. The research approach that was chosen for this study is a qualitative methodology. The researcher purposively selected the participants used in this research, which was ensured to bring a balanced view of the socio-economic backgrounds of the schools around KwaZulu Natal (KZN). As this study is aimed at exploring the perceptions of teachers and learners on the integration of EE in the classrooms in secondary schools in KZN, it was ensured that this pilot study was conducted in a secondary school at uMzinto.

While conducting this pilot study, the researcher used observations to observe Natural Science (NS) lessons related to EE content. It was observed that EE content knowledge was not clear for teachers and learners. There was no need for the researcher to change observations as a research technique as it was a useful tool for data collection in this study because the researcher was able to observe how learners learn in the classroom, their interactions with nature, the teachers' teaching practices and methods without having to ask questions.

During the face-to-face interview, the interview guide used had questions that would provide the same meanings/ answers to the proposed questions, therefore a candidate was able to restructure those questions in a meaningful way. Conducting a pilot study assisted the researcher to rearrange the interview questions and group them in a chronological manner. It allowed her to change some questions and ask questions in the language in which the interviewee is

most comfortable, in this case, questions were asked and answered in IsiZulu. The data collected allowed the researcher to restructure the questions to fit the research questions and to manage time when interviewing a teacher, because teachers have busy schedules.

While conducting a focus group with the learners, it was noticed that since the number of learners are grouped in eight (8), pressure should not be put on them when answering the questions as some questions are more general and it prepared the researcher for the actual data collection of the research study. It also trained her to probe responses from participants, as sometimes they remained silent and did not respond to the questions asked or only a few participants responded. Conducting this pilot study assisted the researcher in collecting research data, as she gained experience from this pilot study.

4.4. DESCRIPTION OF CASES

This research has employed a multiple case study method as a research design, made up of three schools. The three cases are presented in a table form below:

Table 2: Cases

CASE 1	**CASE 2**	**CASE 3**
CASE 1 is denoted by; SCHOOL A It is presented by; TEACHER A	CASE 2 is denoted by; SCHOOL B It is presented by; TEACHER B	CASE 3 is denoted by; SCHOOL C It is presented by; TEACHER C

4.5. DATA PRESENTATION AND ANALYSIS PROCESS

In the process of analysing the data, the researcher needed to be engaged with the data by reading the participants' responses and becoming familiar with the data collected. Data is transformed into findings through analysis by bringing order, structure and meaning of the raw data (Patton, 2002). As the researcher was translating and transcribing data, she was able to identify patterns on similar themes. Interpretation entails making sense of and explaining data. It is difficult to separate data collection and analysis as data analysis on its own cannot

provide answers to research questions, as these are found by methods of interpretation of analysed data (Krueger, 2005). Codes, themes and categories emerged from the data collected. Below is a table with codes which emerged from the data.

TABLE 3: CODES

DESCRIPTIONS	CODES
1. Perception on Environmental exposure to participants	**PEP**
2. School perspectives on Environmental Exposure	**SPE**
3. Perceptions of Teachers on Environmental exposure	**PTE**
4. Perceptions of teachers and learners on the Meaning of Environmental Education	**PME**
5. Practices in Teaching Techniques	**PTT**
6. Practices to Improve Environmental Education	**PIE**
7. Practices to meet the Objectives of the Environmental Education lesson	**POE**
8. Practices that are Effective to Teach the lesson	**PET**
9. Practices of Teachers to Deliver the lesson	**PTD**
10. Practices to meet the Purpose of Environmental Education	**PPE**
11. Practices Enhancing practicality of the Environmental Education Curriculum	**PEC**
12. Impacts of Shaping learner Behaviour	**ISB**
13. Impact of EE in Life	**IEL**
14. Impact of Sustaining the Environment	**ISE**
15. Impact of the Role of EE to reduce environmental threats	**IRE**
16. Challenges of the Environment and mitigation Strategies	**CES**
17. Challenges Experienced by Teachers	**CET**
18. Challenges in Handling events in EE	**CHE**
19. Strategies to overcome Challenges of EE	**SCE**

The table below discusses the themes and the categories which emerged from each theme.

TABLE 4: THEMES AND CATEGORIES

Themes	Categories
1. Perceptions on environmental exposure	• Learners' perspectives on environmental issues. • Schools perspectives on EE. • Teachers' perspectives on provision of resources on the teaching of EE. • The meaning of environmental education (EE).
2. Practices in teaching Environmental Education	• Techniques to teach EE in different subjects. • Improving EE in the classrooms and implementation of an EE curriculum. • Effectiveness of teaching methods and practices. • The most interesting class activity in the EE lesson. • Practicality of EE curriculum in classrooms.
3. Impacts of Environmental Education	• Shaping learners' behaviour and Impact of EE on learners' behaviour towards their environment. • The impact of EE on the life as an individual, learner at a school, a society member and a family member. • Sustaining the environment and dumping sites in the communities. • The role of EE in mitigating environmentally threatening factors.
4. Challenges which hindered the teaching and learning process	• Environmental challenges and mitigation strategies. • Experiences of teaching EE as a curriculum implementer. • Handling of unexpected events in the teaching of EE.

	• Strategies to overcome challenges encountered in teaching EE.

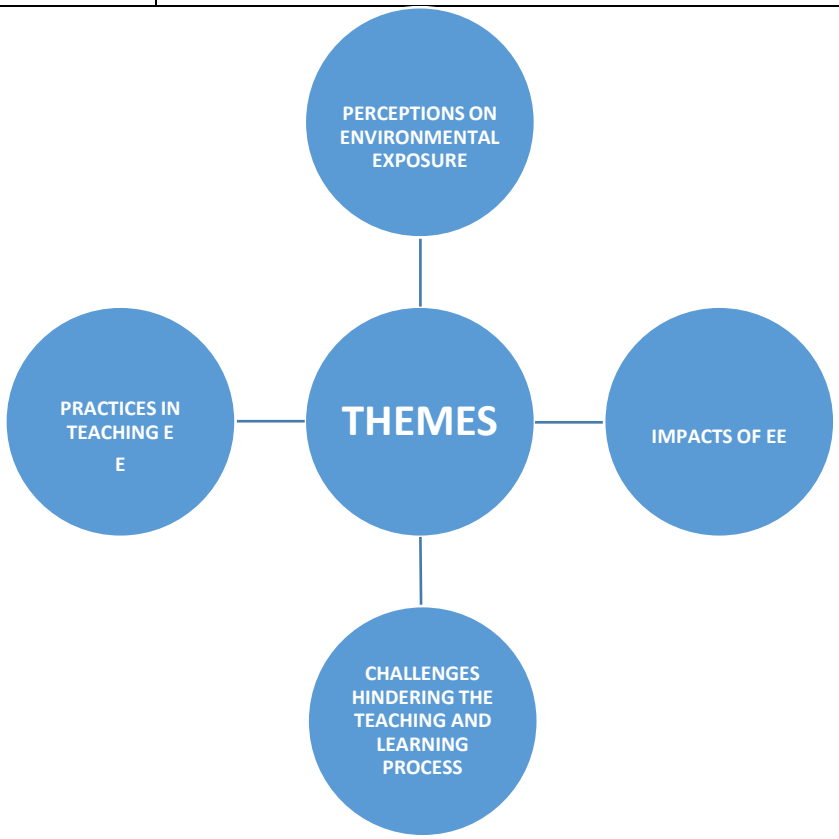

Figure 9: Showing the themes

4.6. DATA PRESENTATION

During data collection intensive data was collected which enhanced the final findings of this study. Data was collected from 24 learners in senior phase grade 8 NS classes using focus groups as a data collection tool. Face-to-face Interviews were conducted with three teachers from three different schools, all teachers taught NS in grade 8 classes and observations were also conducted in three different schools and in the three classes that are presented below. Three data collection tools were employed to reach the aim and objectives of this study.

4.6.1. Focus group interviews data presentation

Focus group interviews were used to collect data from learners to acquire knowledge of how they perceive the integration of EE in the school curriculum. According to Dilshad and Latif (2013), the aim of focus groups is to collect high-quality data in a social context which primarily assists in understanding a specific problem from the viewpoint of participants. Data collected from the focus groups was presented in the form of four themes, namely perceptions on environmental exposure, practices in teaching EE, impacts of EE and challenges which hindered the teaching and learning process, as discussed in the next section.

Theme 1: Perceptions on environmental exposure

This section is aimed at exploring how learners in grade 8 interpret the concept of environment in each school. In School A, learners emphasised that when they think of the concept of the environment, they think about ways of keeping their environment clean. These are the responses of learners: one learner stated that,

"…I think about to take care of our own environment", while another learner said *"I think about not polluting our environment".*

It seemed as that learners in School A view the environment as a place that needs to be kept clean. El-Houfey and Areeshi (2014) stress the need for having a clean environment so that people can live healthily and sustain the earth for future generations. The question on what EE means to them as learners, was responded to as;

"…It teaches us how we should treat our environment so that it will not be contaminated".

Another learner mentioned that,

"…It teaches us that the lives of people should always be healthy and of the animals living outdoors".

To learners, it seemed as that EE means being taught how they should take care of the environment in order to protect it.

For another question aimed at exploring their environmental knowledge of the aspects that make up the environment and ways to sustain them, learners in School A responded that the aspects that make up the environment are plants,

"…We can take care of them by watering them and take care of the earth by cleaning it".

It can be said that learners in School A view the aspects that make up the environment as physical aspects of the environment such as plants and water. By contrast, The Psysiologist (1989) views the environment as the interactions between living organisms.

In School B, learners responded that to them, the concept of the environment makes them think of all the things that make up the environment. One learner in School B stated that,

"…I think about soil".

Another learner mentioned,

"…*I think about animals and people that interacts".*

From the viewpoint of the learners in School B, the environment is made up of all of the physical components. On the meaning of EE, learners stressed the need to respect, love and take care of the environment. Learners responded that EE,

"…Encourages us to respect our environment",

While another learner stated that,

"It teaches us to love our environment as we love ourselves".
This means that learners in School B view EE as a tool to make people love and respect their environment and in that way they can take care of the environment. In School C, learners alluded that the term environment makes them think of the infrastructure and beauty of nature. They think that the environment is an important aspect of every human's life. One learner stated that,

"…*I think about the place where we live",*

While another learner mentioned that,

"…I think about infrastructures".

From the viewpoint of learners in School C the environment goes beyond the natural environment, including even human-made infrastructure, which to them is seen as the environment. School C interprets EE as teaching them about the importance of the environment. One learner responded that,

"…It means knowing the importance of the environment", while another learner stated, *"to have adequate knowledge of the processes of the environment and what we get from the environment".*

It seems as that learners in School C view EE as a mechanism to educate learners about how vital their environment is and the processes that take place in their environment. On the same note, Tlhagale (2004) defines EE as a process from which people can recognise environmental values and become able to clarify environmental concepts relating to their environment.

In all three schools, the learners have an intense and rich knowledge of what the environment is and what it entails. They know the aspects that make up the environment and what learning about EE means to them.

Theme 2: Practices in teaching environmental education

This section is aimed at exploring practices to improve the teaching of EE in the classroom. In a question posed to learners during focus group interviews on ways that EE learning can be improved in schools, learners in School A responded that EE learning can be improved by bringing posters into the classroom. In the Department of Environment and Natural Resources (2014) revised document it is stated that methods to improve EE teaching and learning include demonstration, where something is shown and described, and this is normally used for difficult concepts. Learners further alluded that if samples of what they learn about are brought to the classroom, this can enhance their learning process, as well as clear explanations by teachers. They said that outdoor education can help them to interact with nature and by doing so their learning can be improved. To learners in School A, learning does not only have to take place inside the classroom as most of what they learn about in EE is based in the physical environment. Kimaryo (2011) also supports this statement by stating that learning about EE involves hands-on activities like making observations of their surroundings and learning through field studies.

School B learners responded to this question by stating that EE can be improved through the provision of lacking resources in schools. Learners in School B emphasised that due to a lack of resources, learning is affected, and therefore, learning can be improved through having enough resources to improve the process of learning. Masino and Nino-Zarazua (2016) mention that the overall findings of their study suggest that interventions are more effective at improving student performance and learning when social norms and inter-temporal choices are factored into the design of education policies and when two or more drivers of change are combined.

School C learners responded that EE can be improved by inviting environmental experts to visit schools to teach learners more about the environment. Learners in School C think that it is important to know about the world's current status, and in that way they can obtain a wide spectrum of knowledge about the environment.

Theme 3: Influence of environmental education

This section is aimed at exploring the impacts that EE have on learners, whether they are able to identify environmental problems and come up with solutions and whether they know about career choices they can pursue in relation to EE.

On a question posed to learners about environmental threats which they have observed and mitigating strategies, learners in School A responded that they have observed littering and the burning of fuels and they can mitigate them by recycling. Learners feel that they can mitigate littering by recycling, which is now a recognised business in South Africa (SA). Recycling is a strategy of waste management and is a large industry driven with a focus on pre-consumer recovery and recycling from businesses and industries (Oelofse & Strydom, 2010). A scenario was then posed to learners regarding an unofficial dumping site which makes people ill in the community where their school is situated. Learners had to provide reasons for people becoming sick and come up with strategies to solve this problem. Learners in School A responded that people become sick,

"…B*ecause they live in a dirty environment"*

And another learner said

"…Because they inhale the smell from the air".

It appears that the learners in School A understand that an unclean environment can infect people with disease. One learner mentioned that he would speak to his parents to contact the ward counsellor on his behalf and negotiate with the municipality to send waste collectors to the area. Obviously, these learners understand that anything that involves the environment involves everybody, including their parents and community workers. Another learner asserted that they can

"…Form a group as learners to go clean at the dumping site and then visit houses to collect their waste to ensure they do not throw them at the same place they use to and recycle".

Seemingly, the learners understand that they need to work together to look after the environment and everyone needs to be involved. The UAE (2016) states that it is everyone's responsibility to preserve the environment. Learners were then asked a question regarding careers they would choose to pursue in relation to EE. One learner in School A responded that,

"…I would consider working at the municipality as a truck driver to collect waste from the communities"

While another learner stated that,

"…I would be a supervisor in the municipality to ensure and select people who will go and collect waste".

Undoubtedly, these learners showed great interest in helping communities to live in a healthy environment.

On a question posed to learners about EE as a tool to shape behaviour towards the environment, learners in School A mentioned that EE has helped them to know where to dispose of and how not to dispose of their waste. These learners perceive that EE has provided them with intensive information which has taught them of how to dispose of waste. Learners further stated that EE has taught them about cleanliness, not to throw away waste that can be recycled and that a polluted environment can affect a lot of people and their ability to live a better life. Boca and Saracli (2019) support the above-mentioned statement by specifying that EE is aimed at teaching and educating the public about the function of the natural environment and how human beings can manage their behaviour and ecosystems. Another question was posed to learners on the impact of EE in a life of a learner, where the learners stated that EE has impacted them by teaching them not to pollute the environment in the communities in which they live to protect and take care of the living and non-living organisms for a better tomorrow. Learners mentioned that EE impacted them in a positive way as they now know how to take care of their environment and how they should live alongside non-living and living organisms as they all play a vital role in the lives of communities.

Learners in School B responded that they have observed the poaching of rhinos and elephant horns as well as the cutting of trees, which is not good for the environment as they provide oxygen. The Endangered Wild-Life Trust (2017) states that even though rhino poaching has been in the spotlight, there has been a decrease on the number of poached rhinos in 2016 because the law enforcement is doing better in apprehending poachers. They further mention that these environmental concerns can be mitigated by encouraging and raising awareness on caring for and not destroying the environment. Learners have recognised rhino and elephant poaching as an environmental threat as these animals will no longer be around if this situation persists, and the cutting of trees will lead to deforestation, which is an environmental threat now. In the unofficial dumping site scenario, School B learners responded that the reason for people getting sick is because,

"…Air is polluted because of the smell".

Learners state that they can solve this problem through putting a fence around that area, ensuring that every household has a bin and pleading with the municipality to send waste collector trucks to collect the waste. Indisputably, these learners understand that the municipality needs to play a larger role in minimising environmental problems as they have environmental experts in their departments who are trained to discern the environment. Venter (2006) states that municipalities, as custodians of the environment, have a responsibility to care for the environment through their activities. On a question of career choices which learners can pursue in relation to EE, one learner mentioned that they would become,

"…P*olice to stop rhino poaching".*

It seems as that this learner is determined to stop people who destroy the environment. On the contrary, another learner stated that they would be

"…A teacher to teach learners about the environment".

This learner seems keen to pass on environmental knowledge and information to other people.

On the question of EE as a tool to shape behaviour towards the environment, one School B learner responded that,

"…It helps us to pass on the information we have received from school to other people who are not at school".

Another learner stated that EE has shaped their behaviour as they are able to pass on the information to their friends, families and communities. Another learner stated that EE has impacted them to beocme a good example in her family while another learner stated that it assisted in learning how

"…To make a living out of caring for the environment".

From the learners viewpoint EE has impacted them positively because they can now make a living out of the environment through recycling and to be a good example in their homes. The Department of Environmental Affairs and Tourism of SA (2019) states that recycling is one of the processes that can be used to minimise waste.

Learners in School C responded that they have observed littering and air pollution from excessive fumes from factories. Learners further stated that they can mitigate these environmental threats by recycling. In this school, learners have observed a lot of littering, which is a universal environmental problem. In School C, learners responded that the reason for people becoming sick from the unofficial dumping site scenario is

"…Because they live in an unclean environment".

One learner articulated that they can solve this environmental problem by requesting bins from the municipality and pleading with community members to

dispose of waste in those bins as well as for waste collectors to collect waste at least once a month. Another learner mentioned that holding a meeting for environmental awareness where people will be taught about caring for the environment would be beneficial. To all appearences the learners have knowledge on who they need to consult in ensuring that their environment is catered for and they know the environmental measures they need to take. Learners in School C responded that the career choices they would pursue that are related to EE include being a,

"…Scientist to teach people about the consequences of their actions",

While another learner mentioned that she would opt for being an,

"…Environmental practitioner to teach people about their environment and how to take care of it".

Ostensibly, these learners are interested in ensuring that people know more about their environment and take initiative to care for it.

When learners in School C were asked the question of EE as a tool to shape behaviour, one learner mentioned that the purpose of EE is,

"…*To teach us never to throw waste anyhow".*

Another learner stated that it is,

"…To show us the consequences of an unclean and unhealthy environment".

Learners further stated that it taught them how to contribute towards a clean environment, how to care for plants and how to save water. EE is seen as a tool to teach people about precautions regarding the environment. Environmental Education in Southern Africa (EESA) (2012) states that EE plays a critical role in addressing environmental problems facing the world today. Learners in School C, on the question of the influence of EE, mentioned that EE has impacted them

by equipping them with skills to teach their family members how to look after and take care of the environment. Learners further articulated that EE has taught them a lot of things which have benefited a lot of people, such as teaching people not to pollute air by their actions, the importance of cleanliness, saving water and the importance of trees. Doubtless, these learners believe that this has helped to prevent people from destroying the environment even further.

Theme 4: Challenges which hindered the teaching and learning process

This section aims to explore challenges which hinder the teaching and learning process in the classroom. On a question posed to learners to share the challenges they have encountered when learning about EE, learners in School A responded that a number of things affect the learning process in their school, such as,

"…We cannot touch and feel the things that we learn about".

Another learner mentioned that they only learn from a textbook. It can be said that, Learners in School A believes that the challenges which hinder the teaching and learning in their school are because they always learn inside the classroom and from a textbook, they do not get a chance to go out, touch and feel the things they learn about because they are limited to a classroom environment. Miller (2017) states that the outdoor education can provide easily accessible contexts for content of interest.

School B learners responded that a challenge which hinders the teaching and learning process in their school is,

"…Not having direct interaction with the things learnt about in the curriculum".

Another learner stated that they lack resources. Learners in this school mentioned that their challenges are a lack of resources and not having direct contact with the nature aspects that they learn about. It seems as that learners believe that when learning about something, you should be able to interact with

it and the case of a lack of resources is a big challenge in their school as they do not get to see other things because they do not have posters or pamphlets.

School C learners alluded that, in their school, the challenges they encounter in their teaching and learning process is that they are not provided with enough information on the topics they are learning about. Learners in this school further mentioned that they lack content knowledge. The learners deduced that they do not acquire full information on the processes and the importance of the things they learn about in EE lessons.

4.6.2. Face-to-Face Interviews data presentation

Interviews were conducted with three senior phase NS grade 8 teachers. Face-to-face interviews were used to collect data from teachers to acquire an understanding of how they perceive the integration of EE. Mathers, Fox and Hunn (1998) state that face-to-face interviews can be the best way of collecting high quality data. Four themes emerged from the data collected from teachers, these are perceptions on environmental exposure, practices in teaching EE, influence of EE and challenges which hindered the teaching and learning process.

Theme 1: Perceptions on environmental exposure

This section aims to explore how teachers perceive EE, as such the researcher posed a question on how the participants describe EE. Teacher A stated that,

"…I think it is one of those subjects that are very important because it teaches us about a lot of things, like cleanliness, and our future depends on it and the knowledge that we have because we cannot survive if we somehow destroy the environment, while we are not aware, so I think it is very important".

It is clear that Teacher A describes EE as a subject which teaches them about environmental cleanliness knowledge that people cannot live without. Teacher A further stated that the environment regards people and everything that involves them. The EE perceptions of Teacher A lie on the spectrum of environmental

cleanliness and its importance. In another question aimed at exploring the experiences of teachers in teaching EE, Teacher A responded that it helps teachers, as they learn a lot from EE and it makes them aware of certain environmental aspects like recycling as well as teaching the community as a whole about their environment. On the purpose of EE being met by teachers and learners question, Teacher A responded that the purpose of EE is not met by teachers and learners because they are under-resourced and teachers deduce that there is minimal time allocated to teach EE content.

Teacher B stated that EE can be described as a subject that teaches about the environment, environmental sustainability for future generations, specifically plants, animals and everything that has to do with the processes of the environment, such as reproduction. Teacher B further described EE as anything that teaches about the environment, including biotic resources. She elaborated further by mentioning taking care of the environment that we were given by God, to look after and protect it in different ways. She further stated that as an educator it is her duty to pass on information to learners so that they grow, knowing that the environment is important to everyone and without it people would suffer because we live in and get food from the environment. Teacher B perceives EE as a mechanism which teaches people about environmental sustainability to secure the future of future generations. However, Tlhagale (2004) states that EE enforces the awareness of and encourages sensitivity to economic, social and political environments as well as to ecological interdependence in urban and rural areas. Teacher B mentioned that the experiences of teaching EE have been wonderful as she has learned a lot, especially on the topics of plants, animal behaviour, types of plants, advantages and disadvantages of plants, the structures of plants, what they produce, diseases that affect the plants and animals in different seasons and how these diseases can be cured. Teacher B emphasised that while in the process of teaching, teachers also learn about certain things that involves the environment which assists them a lot. Teacher B said there is no assurance that the purpose of EE is met.

On the same note, Teacher C alluded that,

"…*I would say EE is anything that will do with the environment, a topic or rather a subject on the environment".*

Teacher C further stated that EE is anything that has to do with our surroundings. When Teacher C was asked what EE means to her as a teacher, the teacher stated that,

"…*It means nothing to me honestly, I have never thought of bringing it into the classroom".*

She further stated that,

"…It is not something I make an effort to do in the classroom".

She then mentioned that she does make examples when teaching NS, for example,

"…There is a topic on ecosystems, there you can take learners out and show them that even though this is a patch of grass that you do not think more about but there is an ecosystem going on there, so they see it, but I do not take them out, but I refer them to it".

By the use of these phrases, 'nothing', 'never', 'not something I make effort' and 'patch of grass, the participant expressed an unexpected response which suggested a somewhat detached and 'disinterested' stance. This shows a feeling of demoralisation, a lack of motivation and willingness to make a change in the process of integrating EE. As she mentioned that EE has no meaning to her, even though she knows she can actually take learners out when learning about environmental topics, she does not take them out which illustrates that she lacks the enthusiasm to perform environmental activities. Teacher C mentioned that she does not have any experiences with EE topics, and even if they were, she could only later realise that those were EE topics because she was not aware of them, since she had not been trained or workshopped about EE topics. Teacher C stated that the purpose of EE is met indirectly because they teach

environmental topics even if they are not aware of the impact, as it is not pointed out that these are environmental topics.

Theme 2: Practices in teaching environmental education

This section aims to explore EE teaching practices, ways to raise awareness on the environmental threats and how EE can be improved. Teacher A mentioned that the teaching practices are sometimes not in line with the purpose of EE because they may sometimes find that they are teaching something that they are not sure about. He added to this by saying that the only way to raise awareness is through education,

"…I cannot think of anything else but through education alone".

Dimante, Tambovceva and Atstaja (2016) state that education and raising awareness is one of the key elements in reducing the environmental impacts of an ever-increasing population. Teacher A further stated that this can be accomplished by visiting churches because that is where you find a lot of people. In improving the teaching and learning of EE, Teacher A stated that it can be improved by being given enough time in the curriculum and to be implemented as a subject on its own.

On the same note, Teacher B mentioned the teaching practices are in line with the curriculum, even though their curriculum is indirect, so as teachers they make sure that when teaching environmental topics they refer to the environment in their communities and concentrate on them specifically through making examples known to them. Teacher B further stated that they use problems that they see and associate it with content, they bring the known to the unknown. Teacher B said it is difficult to say how they can raise awareness, because even when parents are called for school meetings they do not attend,

"It would be difficult to get through this kind of community, they are just not people you can call and educate, unless if you contact their ward counsellor and ask the ward counsellor to cascade the information to them".

It was further mentioned by Teacher B that it can be improved by including outdoor learning and the creation of gardens. In support of what she stated, Teacher B further elaborated that

"…A *lot of things must be provided and encourage educational trips so that learners can go out and learn and ensure that all planning is on paper".*

Teacher B added that it is important to have everything written down because if the planning of tours is not on paper, teachers end up discouraged to engage themselves in educational tours.

On the same imperative, Teacher C mentioned that teaching practices are not in line because,

"…What I do is to teach content, learners write examinations and pass to the next grade".

Teacher C alluded that they were not even aware of the environmental topics, therefore the teaching practices were not in line with the purpose of EE, which is to create citizenry that is cautious of their environment. Khademi-Vidra (2017) states that the main goal of EE is to create environmental awareness among the public so as to encourage conservation. Teacher C further stated that most of the things seen around the communities is because the ward counsellor and municipality members are not rendering services to the community, so to raise awareness they will have to consult ward counsellors to provide primary needs. On the same point, Teacher C stated that EE can be improved by reducing the amount of content,

"…I feel like it is a lot, so that why we do not have enough time to do everything. But something has to be adjusted."

She added that with the use of Informantion Communication Technology (ICT), learners would be able to watch a video on how something actually takes place,

"…The use of Information Communication Technology (ICT) can improve EE, because ICT is capable of bringing what we cannot bring in the classroom for instance, Space".

Adu and Mireku (2017) state that the use of ICT can have a great influence on the learning and teaching of EE. From the teacher's viewpoint, ICT can be used to improve the teahing and learning of EE in the classrooms.

Theme 3: The Influence of environmental education

This section aims to explore the influence of EE in the lives of teachers and learners. Teachers were asked how learners behave towards the environment. Teacher A stated that in their school there is little influence of EE as there is no change on how learners treat their environment. Teacher A further alluded that the role EE can play is great because it can also be extended to factory and industry workers on how to dispose their waste.

While Teacher B stated that there is some influence, but their knowledge still needs to be extended. Teacher B mentioned that EE can play a great role in the communities because learners can pass on the information they have acquired from school to their family members and communities as they will know which behaviours to discourage and pass on information to people regarding how to look after their environment. By having teachers who portray environmentally-friendly behaviour towards the environment, learners themselves can then imitate their conduct and change their behaviour (Bandura, 1971).

On another note, Teacher C responded that there is no influence as learners may not be aware of their actions towards the environment. The role of EE, as emphasised by Teacher C, is to provide learners with information that will help them to come up with strategies to save water and mitigate other environmental

problems. Khademi-Vidra (2017) states that the aim of EE is to provide a quality environment.

Theme 4: Challenges which hindered the teaching and learning process

This section is aimed at exploring the challenges which hinder the teaching and learning of EE in the schools. On a question of whether the curriculum is practical in the classroom, Teacher A stated that it is not practical, but there is a way in which it can be made practical in schools because each school can make their own rules that work for them. On another question on the curriculum being successfully implemented, Teacher A responded that the curriculum of EE was not successfully implemented,

"…*There are too many gaps, even though it was integrated in all subjects, but I think it needs its own time and be a subject on its own".*

It was mentioned by Teacher A that EE was not implemented in a proper way as it has left some gaps, such as the training of teachers for integration. On another question, which was on challenges that were encountered by teachers and ways to overcome them, Teacher A responded that he cannot trace any challenges related to EE as it is in relation to the things around them and that can be seen daily. Another challenge was said to be the unavailability of environmental clubs in schools. Teacher A mentioned that there is no environmental club because when they come to school the first period starts and there is no time.

Teacher B responded that the curriculum of EE is not met,

"…*Because it covers the theory mostly, it talks about what is written on the books"*,

Teacher B further stated that there are certain topics which demand to be taught outside the classroom, but outdoor education is impossible, or to go on environmental educational tours, which have not occurred in a long time. She further stated that the EE curriculum should be improved to include field trips,

whereby learners and teachers would go on tours to explore the environment at large. According to Teacher B, the EE curriculum was implemented successfully because last year they were taken to a museum by subject advisors to instill environmental values to future generations. She further stated that they have encountered challenges such as,

"…*Other learners get bored on other environmental topics like gases because they do not see them".*

She further added that there is a lack of interest from learners as they tend to get bored on certain environmental topics. She mentioned that there is no environmental club in their school and there has never been one before.

Teacher C's inclinations seem to be aligned with Teacher A when she stated that it is not practical,

"…*Firstly learners loves going out and see those things, there is no outdoor education in NS curriculum or maybe it depends on how each teacher plans it in their lesson plan*".

She further stated that from her side, she has never taken learners out of the classroom, but she is of the opinion that learners should be taken out because learners enjoy to view the things that they are learning about and this can intrigue learners' interest to listen and understand the topic which will enable learners to see that things they learn about are closer to them and they would not separate themselves from environmental aspects. Teacher C mentioned that most learners enjoy outdoor education and it is important that this is taken into consideration during curriculum development. Brookes (1989) mentions that many good teachers conduct outdoor education activities. Teacher C stated that EE was not well implemented because there are some environmental aspects that they have lost,

"…*Because when we talk about the environment we cannot restrict it into a classroom, which is what is happening now and you see that there are a lot of things that learners are missing out*".

She further mentioned that EE needs to be expanded in secondary schools because they are given minimal time as they are pressured to finish the curriculum. She added that no one is enforcing it and no one will ask whether it has been done or not because it seems unimportant to the curriculum developers and to teachers. Seemingly, teacher C feels like EE is not implemented successfully because it seems like the EE curriculum is limited to the classroom environment. This means that learning only takes place within the classroom. Teacher C also mentioned that the challenges that she has recognised are: a lack of time, lack of resources, being pressed to finish curriculum and ending up not teaching EE at the best of their ability as a teacher. Teacher C added that another challenge is that they do not have environmental clubs in their school, though they have it on paper so that when the department official comes they show that they are implementing it, however it has not been functional.

4.6.3. Observations data presentation

Observations were conducted in three different schools which are presented as Case 1, Case 2 and Case 3. This section presents the data that was collected through observing the school environment, facilities, teachers and learners' behaviour towards the environment and the learning and teaching of EE. The research findings are presented in four themes which emerged from the participant's data.

Theme 1: Perceptions on environmental exposure

This section aims to explore the teachers' EE content knowledge, learners' perceptions of the EE lessons and the behaviour of teachers and learners towards their environment and their interaction with their environment in schools. When the researcher observed School A, the teacher seemed to have immense knowledge of the subject because he was able to share all aspects of the lesson in a concise manner, however the learners looked like they had no interest in the

lesson, they seemed bored because the learners need something that engages them and challenges them to think outside of the box and present solutions. When the researcher conducted face-to-face interviews in this school, the teacher mentioned that there is no time for environmental outdoor education. During observation it could be seen that there was no sign of interaction between the teachers and learners with their environment. Teachers and learners had a negative attitude towards the environment as there were no gardens in school. These attitudinal barriers were also recognised in a study conducted by Ham and Sewing (1988), such as viewing EE as less important and not frequently conducting EE discussions and activities.

On the same note, in School B the teacher seemed to have a good grasp of the CAPS document as the teacher displayed adequate knowledge of the lesson and was able to trigger prior knowledge that learners had, thus the objectives of the lesson were met. In this school, learners participated collectively with the teacher as they showed great interest in the lesson being delivered. The grounds of this school contradicted what the teachers and learners said about strategising ways to sustain the environment because they did not seem like they are sustained. The teachers and learners of this school displayed adequate knowledge of EE, however when it came to putting them into practice, there were no results as learners were seen littering the school premises during break times. There seemed to be no interaction of teachers and learners with their environment as there were no plants in their school environment.

In School C, the teacher in this school displayed great knowledge of the subject matter. The teacher was able to link examples from the environment with the content of the lesson. During teaching and learning, learners were engaged as most learners were participating and responding to the teachers' questions. Their reactions were positive as they were participating and answering the questions asked by the teacher. In this school, teachers and learners seem like they did not play any part in securing and caring for the environment, as the teacher from this school mentioned that every day, after break, the school caretakers go around the school to pick up litter. They view it as not being their responsibility to care for the environment, but rather that of caretakers. Caretakers are referred

to as the people who cleans the schools grounds and classes. In all three schools, teachers showed a lack of EE content knowledge and how to teach EE related topics to enhance behavioural change. The learning theory adopted by this study shows that teachers can influence the behaviour of learners to change (Bandura, 1987). On the same note, in all schools, School A-C, it transpired that EE assessments do not take place, as teachers mentioned that EE topics are not clearly indicated in the CAPS document. The question raised by this research is that, how then do teachers assess the knowledge of EE and how do they assess that learners understand their responsibilities when it comes to the environment? Furthermore, in observations, it transpired that EE is viewed as an unimportant aspect by the teachers and learners. Teacher C mentioned that EE seems unimportant to department officials and School Management Teams (SMT).

Theme 2: Practices in teaching environmental education

This section aims to explore the teaching methods and practices used to better teach EE and its effectiveness. Schools A, B and C all use normal teaching aids, like chalk, chalkboards and textbooks to teach EE in the classroom. These schools all seem to adopt the same style of teaching learners. This teaching style is called a blended style. Blended style (Shinn, 1997) follows an integrated approach to teaching which blends the teacher's personality and interests with learners' needs and curriculum-appropriate methods. During these observations, it was noted that the teaching methods used in Schools A, B and C are not effective enough, especially in School C where the teacher was teaching learners about the process of photosynthesis, where the researcher is of the opinion that the learners would have understood it better if they were able to see this in a video format. In schools, the use of technology could be a great shift that the education system can take advantage of to employ technology in the classroom for better teaching and learning.

Theme 3: Influence of environmental education

This section aims to explore the influence of EE on learners and teachers. The impact of EE should be to change behaviour towards the environment, therefore in School A and B, the learning and teaching of EE in schools needs to be

enhanced to reach this goal. The problem behind learners' negative behaviour towards the environment stems from the teachers' attitudes. According to this study, learners' behavioural change mainly relies on the behaviour of an observed model, which in this case is the teacher (Bandura, 1987).

However, in School C, they tend to differ. There is no sign of EE impacting the lives of teachers and learners in the school because as long as the school hires people to be responsible for cleaning the school grounds after breaks, they can never learn to preserve the environment themselves.

The schools' infrastructure and the conditions in which learning and teaching of EE takes place plays a vital role in impacting the lives of learners and teachers. In support of this statement, Teixeira, Amoroso and Gresham (2017) state that buildings, classrooms, laboratories and equipment are crucial elements of learning environments in schools and universities. All of these schools fall into a low socio-economic background, therefore such schools are mostly under-privileged when compared to model C schools and EE tend to impact the lives of teachers and learners differently. Even the learners' performance varies between schools with low-socio economic backgrounds and model C schools (CEOD, 2004).

Theme 4: Challenges which hindered the teaching and learning process

This section is aimed at exploring the factors which hinder the effectively teaching and learning of EE in the classroom. A lot of factors such as a lack of teaching resources, a lack of content knowledge in teachers, a lack of enthusiasm to raise awareness, lack of time during the school day and careless behaviour in these three schools have been observed as hindrances in the teaching and learning process of EE. These findings are in line with the findings of Ham and Sewing (1988) and Rahman, Halim, Ahmad and Soh (2018), as they also discovered that amongst teachers, there are conceptual barriers which stem from a lack of consensus about the scope and content of EE; logistical barriers that stem from a perceived lack of time; funding; resources; educational barriers that stem from teachers' misgivings about their own competence to conduct EE programs and

attitudinal barriers which stem from teachers' attitudes about EE and science instruction. In School A, a lack of resources hinders the teaching and learning process in the classroom, as was confirmed by a teacher in this school during the face-to face-interview. On the same note, in School B there were no charts, pictures or samples in the classroom, and it was observed that these are the things which hinder teaching and learning in this school. Even lights in the classroom were not working. In School C, they lack the teaching aids which are appropriate for the lessons being taught, lack resources and battle with time management. The time allocated to teach lessons are short, which makes teachers become pressured to complete the lesson even though there were other aspects which needed to be covered.

4.7. DATA ANALYISIS AND INTERPRETATION

Data collected was analysed and interpreted using thematic analysis. The focus groups and face-to-face interviews were conducted in order to understand the perceptions of the teachers and learners towards the integration of EE in the classroom. Lessons from three different schools were observed in order to fulfill the aim of this study, which is to find out how teachers in public schools interpret and make sense of the integration of EE within the new curriculum and how this influences learners.

4.7.1. Focus Group, Face-to-Face Interview and Observation Data analysis and Interpretation

The previous section discussed data presentation while this chapter focusses on data analysis and interpretation using the same themes which emerged during data presentation. The themes which emerged from this study are perceptions on environmental exposure, practices in teaching EE, impacts of EE and challenges which hindered the teaching and learning process, as discussed in the next section.

4.7.2. THEME 1: Perceptions on environmental exposure

Learners' perspectives on environmental issues, schools' perspectives on EE, teachers' perspectives of EE and the meaning of EE were the categories that emerged from the data in this theme.

4.7.2.1. Learners' perspectives on environmental issues

This section seeks to explore the understanding of the concept of the environment by learners in schools A, B and C. It emerged from the focus groups that there is a common understanding when it comes to the meaning of environment. The issues of environmental cleanliness, respect and love are at the core of their understanding. Both schools A and B supported each other as School A learners stated that,

"…*I think about to keep our environment and communities clean*".

While on the same note, School B learners mentioned that it teaches them to respect and encourages them to love the environment as they love themselves. This quote, highlights the importance that respondents have shown towards having a thorough understanding of issues which could threaten environmental cleanliness. Numerous issues which affect the environment are being discussed globally, such as water shortages, loss of biodiversity and global climate change (Blue Planet Prize, 2012). In contrast, School C's perception of the environment tend to differ as they view the environment as something which is beyond just the natural environment, and included human-made structures as they mentioned infrastructure. Doyle and Havlick (2009) mention that infrastructure is used to control natural processes to extract natural resources. However, School C highlighted the importance of infrastructure as part of the environment. The learners of this school stated that,

"…*I think about a place with many infrastructures".*

School C raised a critical point because it shows that the environment is being understood in the context of natural disasters, which usually impacts infrastructure negatively.

From the learner's perceptions of the environment, it can be seen that there are variations. The learners perceive the environment both objectively and subjectively. Learners who perceive the environment objectively focus on the things which are physical, can be seen and touched. In contrast, Kimaryo (2011) mentions that to learners, something that cannot be seen nor been touched is not considered as the environment. Learners who view the environment subjectively consider the physical environment as influenced by social and political factors as they mentioned infrastructure, because infrastructure is largely influenced by social and political factors.

4.7.2.2. Schools perspectives on EE

The importance of EE is to engage young minds in the excitement of first hand observation of nature and understanding the patterns and processes in the natural and social worlds in order to take care of the habitat and its surroundings, which becomes a major part of EE in school education (Gopal, 2004). Learners in Schools A, B and C have a common understanding in terms of environmental conservation. Learners in School A stated that,

"…*It teaches us how we should treat our environment"*.

This section highlights the importance of EE in teaching about caring and protecting all people and animals living on earth. Learners in School C highlighted the importance of acquiring knowledge about the environment and the benefits of protecting it. Learners in School C added that it is important because they acquire adequate knowledge about the processes of the environment. Songqwaru (2012) asserts that EE encourages learners to research, investigate how and why things happen and make their own decisions about complex environmental issues. The researcher believes that knowledge about the environment should not be limited to protection and cleanliness, but also the benefits that EE delivers to people. For instance, the economic benefits, such as tourism and economic development as well as curbing rhino and elephant poaching. However, during observations it transpired that EE is viewed as an unimportant aspect by the teachers, school heads (principals and School

Management Team) and learners. Nijhuis (2011) stated that EE has failed because it is not keeping pace with environmental degradation. In these three schools, not even one manager seems to be interested in the affairs of the environment, as school managers do not emphasise the importance of the environment or stress the need of the functionality of environmental clubs in schools which involve teachers and learners. In School C, Teacher C mentioned that EE seems unimportant to the department officials and the School Management Teams, because no one is emphasising EE and outdoor education and no one will ask whether learners have been taken outside or not. This statement clearly demarcates that the integration of EE training must start from the upper level, which is from the department, down to school components.

The three schools seem to adopt a similar style, which is ignorance towards the environment, as in these schools teachers and learners have a negative attitude towards the environment as no environmental clubs are in place and there are no environmental programmes which involve teachers and learners. How can it then be expected of learners to express an environmentally-friendly behaviour when they are not motivated to do so? Even in other subjects such as Mathematics and Sciences, in order for learners to excel and produce good results they have to be consistently motivated. In a study by Lord (2017), it is stated that motivating learners to be enthusiastically receptive is one of the most important aspects of mathematics instruction and a critical aspect of any curriculum. Why is it different for EE? This clearly shows that there is no understanding of how integration of EE should take place. Even for the integration of language education in other subjects, it was specified that integration is not simple (Wolff, 2003). It is therefore discovered by this study that the integration of EE needs proper planning and implementation.

4.7.2.3. Teachers' perspectives on the provision of resources, content knowledge to teach EE and assessment measures

This section concentrates on the use of resources in EE teaching, content knowledge and assessment measures. For teachers to meet the purpose of EE, which is to equip citizens with skills to secure the future, the issue of a lack of resources has emerged. Teacher A stated that successful teaching relies on the

availability of resources. Bizimana and Orodho (2014) stress a need for the availability of teaching and learning resources for effective classroom management and content delivery by teachers. Although Teacher A raised the point of resources, the reviewing of the curriculum to accommodate EE is equally important. This statement is in line with a learners' argument in School B, where they stated that they need to interact with the environmental aspects which they learn about.

Teacher B and C brought up the role that technology can play in EE. Teacher B stated that,

"…*Yes! I always say that as long as they grow, learn and told about the environment even on social media, they grow with the knowledge in knowing how to take care of the environment. But I am not sure whether it is met. On teachers' I would say yes, because I have seen teachers' even Geography teachers that they have knowledge of the content, it learners that I am not sure about".*

While Teacher C stated that,

"…*The use of Information Communication Technology (ICT) can improve EE, because ICT is capable of bringing what we cannot bring in the classroom for instance, Space*".

Odhiambo (2013) states that ICT in education is used to promote information literacy, which is the ability to access, use and evaluate information from different sources so as to enhance teaching and learning. The respondents argued for the significant role that the use of technology can play in teaching EE. The researcher is of the opinion that since the current generation is mostly used to computers and video games, interactive technology can be utilised to pass on environmental knowledge effectively so that learners can be exposed to various environmental aspects.

Papadakis and Kalogiannakis (2017) state that the use of mobile technologies to support the learning process has become acquainted with the development of

21st century skills. They further state that technology can change the nature of learning (Kalogiannakis et al, 2017). Teachers in these three schools lack EE content knowledge. In School C, Teacher C had to ask the researcher during the interview what EE actually is and why it is included in the curriculum. In Schools A and B, teachers were not sure which topics were meant for EE. During the observations, as stated earlier, it transpired that EE is not assessed. Teachers stated that EE topics are not clearly indicated in the CAPS document, therefore it is for this reason that there is a continuous negligence of learners toward the environment. This shows that the integration of EE needs to be revisited and re-implemented.

Johnson (2005) states that the integration of EE into different subjects creates a number of limitations and challenges to education systems. Kadji- Beltran (2002b) further states that it is argued that when EE is integrated into the content of other subjects, learners fail to develop a clear understanding of what different disciplines or forms of knowledge contribute to the understanding of an environmental topic. The researcher believes that for all knowledge acquired, that knowledge must be assessed to check the level of understanding, to enhance a change in behaviour and to motivate learners for better results. It is for this reason that other researchers still question the integration of EE in other subjects because the assessment usually only concentrates on a particular subjects' content. In a study by Jacobson (1995), it was discovered that there are no permanent personnel, resources or facilities dedicated to EE in schools. It is highly recommended by this research that EE must be assessed in the same manner as other subjects because EE also equips learners with skills which contribute to the future of citizens. Because of the lack of EE content knowledge in teachers, the assessments are not performed by them. Having learners to be assessed can help alleviate and promote environmental-consciousness behaviour in learners as they will have to portray the skills acquired and obtain marks for that in future.

4.7.2.4. The meaning of environmental education (EE)

It is imperative that teachers have a thorough understanding of EE. All

respondents from the three schools (Teacher A, B & C) seem to share a somewhat similar meaning of EE, as Teacher A stated that,

"…*I think it is one of those subjects that are very important because it teaches us about a lot of things, like; cleanliness and our future depends in it and the knowledge that we have because we cannot survive if we somehow destroy the environment, while we not aware, so I think it is very important*."

Teacher B's interpretation placed more emphasis on the fact that EE involves everything that has to do with the environment, a topic or a subject on the environment. Furthermore, it emerged that the teachers' individual interpretation of EE includes taking care of the environment that was provided by God, looking after and protecting the environment in different ways, looking at how rhinos were killed, taking care of the environment in many ways and, as a teacher, passing on information to learners so that they grow knowing that the environment is important and without it there would be no life for people due to the fact that they survive because of the environment and obtain food from it. The Barilla Center for Food and Nutrition (2013) states that it is essential to find a way of living and eating which promotes human and environmental welfare.

The three teachers perceive the meaning of EE to them as teachers and individuals differently. Franzen (2017:2) states that EE provides the methods and content that can lead to environmental literacy and a more sustainable future. The teachers and Franzen (2017) perceive EE in a similar fashion, as they view EE as a mechanism to teach them about the processes of the environment. The teachers however, were only limited to caring for the environment and not focused on how to improve it. The researcher believes that EE not only focusses on taking care of the environment, but also on improving it to be a better place for everything to live in.

On the same note, Teachers A and B indicated the same meaning of EE. As stated by Teacher A, EE helps teachers, as they learn a lot from it and it is responsible for making them aware of important environmental aspects such as recycling. Teacher B mentioned that she has learnt a lot about specific topics of the environment in the process of teaching EE. Teacher C's response tended to

differ, as she provided a shocking and disturbing response which showed a lack of interest in EE knowledge, lack of motivation, lack of enthusiasm and a detached and disinterested stance towards EE and teaching as a profession. Teacher C stated that EE means nothing to her, that she has never thought of bringing it into the classroom and it is not something she makes an effort to do. Those few phrases; nothing, never and no effort, illustrates a great lack of motivation. If a teacher mentions that EE is not something that she has ever thought of bringing it into the classroom, then the question is raised as to what the teacher was doing before this research was conducted? Does this mean EE was not taught in the classroom during her teachings or it is because the teacher does not know what EE entails? How was EE integrated in the school curriculum? Was the integration implemented and how? This shows that integration was not properly implemented and this supports the recommendation of EE teacher training. Buza (2010) stated that EE lags behind when it comes to adopting changes related to environmental and social justice and to engage the community in making what is learned in public schools and universities as central concern.

From learners' perspectives, EE in School A is perceived as meaning to be taught about the environment, while learners in School B stressed the importance of respecting and loving the environment. School C learners view EE as a tool to teach them about the processes of the environment. The learners in these three schools understand the purpose of EE in the school curriculum and the researcher believes that if integration was successfully implemented, the learners would be able to practice their full capabilities in an environmental perspective. In a study conducted by Agnes and Nor (2010), the participants also mentioned that there are major problems in the implementation of EE.

4.7.3. THEME 2: Practices in teaching Environmental Education

Under the theme practices in teaching EE, various categories emerged, namely techniques to improve the teaching and learning of EE, efficient implementation of an EE curriculum and incorporation of an EE curriculum in classrooms.

4.7.3.1. Techniques to improve the teaching and learning of EE

This section is aimed at interpreting techniques to improve the teaching of EE in the classroom. The techniques that this study discussed are the provision of teaching aids, i.e. posters; the creation of environmental awareness groups, stakeholder engagement, the incorporation of environmental trips and the use of ICT in schools. The findings of this study illustrate that EE can be improved through the provision of adequate resources. During focus group interviews in School A, one learner mentioned not having samples brought to the classroom is a challenge to their learning. This means that schools lack resources to improve the learning and teaching of EE. Tlhagale (2004), in his study also discovered that a lack of resources is a problem that is being experienced by schools. Through the discoveries of Tlhagale (2004), it is shown that a lack of resources has been a problem in schools and it has not been attended to as yet. As a technique to improve the teaching and learning of EE, learners in School A suggested that posters must be brought into the classroom. Yale (2019) supports this statement by positing that posters are essential tools which enable visualisation in the classroom to foster student's learning. On the same note, learners in School B mentioned that the provision of resources in schools can improve the teaching and learning of EE. Learners in School C stated that to improve the teaching of EE, schools should invite environmental experts to visit schools to teach learners. For the learners in Schools A and B, their emphasis of improving EE teaching lies on the provision of resources. These learners feel like their schools lack teaching resources. The researcher is of the opinion that teaching and learning can definitely improve when enough resources are provided to schools. Learners in School C place the improvement of EE teaching and learning in the hands of the environmental experts, as learners in this school think that the teaching of EE should not only be the responsibility of a teacher, but also of environmental specialists and other governmental institution personnel such as the municipality (environment and disaster section). It is the people in these institutions who have better knowledge on the world's current environmental status. Teachers in these three schools have different views on whether the teaching practices of EE are in line with the purpose of EE. However,

according to the EPA (2017), the purpose of EE is to teach individuals how to weigh various sides of an issue through critical thinking and it enhances their own problem-solving and decision making skills. Thus far, it seems like learners are not challenged by the EE learning system to think critically, as there are still environmental problems in their schools that are caused by them. According to Teacher A, the teaching practices are sometimes not in line with the purpose of EE

"…*Because sometimes you may find that you are teaching something that you are not even sure about*".

During observations it transpired that teachers do not know the purpose of EE or why they necessarily have to teach EE. In contrast, Teacher B stated that the teaching techniques are in line even though their curriculum is indirect, therefore as teachers, they have to ensure that when teaching environmental topics, they refer to the environment in their communities and make learners concentrate through utilising examples known to them. Teacher B raised a critical point of having an "indirect curriculum". According to the researcher's understanding, an indirect curriculum is a curriculum with no direct instructions on how the learning and teaching of a specific subject is specified. However, Teacher B feels that an EE curriculum is indirect. From the above-mentioned statement, it is clear that there is implementation and integration problems in schools, because how can there be an indirect curriculum if the integration and implementation was successful? Teacher C supports Teacher A by also stating that the teaching techniques are not in line with EE purpose. In support of this, she stated that,

"…*What I do is to teach content, learners write examinations and pass to the next grade*".

Thus far, as stated by (Unesco-UNEP, 1985), the process of EE entails practice in decision-making and self-formulation of a code of behaviour about issues concerning environmental quality. This shows that the purpose of EE is not met,

because learners are not given an opportunity to apply their skills. For now, there is no proper alignment between teaching techniques and the purpose of EE. It emerged that teachers pay more attention to content rather than the purpose of EE. With the new education system, teachers seem to be doing more administrative work than teaching. Hence, they end up teaching learners to pass the exams. There seems to be too much pressure on performing administration work and covering the curriculum in a given time from the school management and departmental heads. During observations in these three schools the teaching techniques used by teachers' in the classrooms were explored. In Schools A-C it was observed that for the purpose of teaching and learning EE, they employ the use of chalk, chalkboards and textbooks only as teaching aids and all of these schools seem to adopt similar methods of teaching learners.

The use of these teaching techniques alone seems to be ineffective in EE learning as they limit the content of EE in the classroom. Specifically in School C during observation, the researcher felt that if the topic of photosynthesis was taught using more "advanced" teaching methods such as ICT, the topic would have made more sense to the learners. UNESCO (2004) state that the use of ICT can be used to enhance learning in the classroom. In the teaching and learning of EE, learners would learn better if they were to be exposed to the use of technologies in the classroom from an early stage.

Furthermore, learners in School A suggested outdoor education as means to improve EE. One of these learners stated that this can help them interact with nature, and by doing so, their learning would be improved. These learners reflect that EE learning and teaching should not be limited to a classroom context. The arguments of these learners are in line with Teacher C's response mentioned earlier that EE needs to be extended to a broader spectrum. Learners in School B state that due to a lack of teaching and learning materials, learning and teaching is affected. To improve EE, Teacher A mentioned that EE can be improved by raising awareness regarding environmental threats. He stated that EE can be improved,

"…*Through education alone*".

He added that this can be accomplished through visiting churches because that is where you find a lot people. It was further mentioned by Teacher A that EE can be improved by allocating sufficient time in the curriculum and to be implemented as a subject on its own. Du, Wang, Brombal, Moriggi, Sharpley and Pang (2018) state that environmental awareness amongst citizens contributes to decreasing environmental threats. Teacher A views education as the only tool to solve environmental problems, which is in support of Howe's (2009:8) statements regarding education as a means to integrate principles of sustainable development with human values and perspectives in order to create a sustainable society. However, Teacher A feels like the time allocated for an EE curriculum is insufficient and needs to be extended. According to observations, the time allocated in the curriculum is enough, and if teachers were properly trained on strategies to teach EE they would know how to utilise their time effectively. This draws back to the issues of a lack of content knowledge, implementation and integration.

Teacher B feels like it is not easy to mention how EE can be improved because she is concerned that in the community in which she teaches, people are ignorant, and to raise awareness would be difficult as parents do not attend parental meetings in the school, therefore it is difficult to get through them. She stated that,

"…*It would be difficult to get through this kind of community, they are just not people you can call and educate, unless if you contact their ward counsellor and ask the ward counsellor to cascade the information to them*".

This statement shows that EE should not be limited only in a school context, as various stakeholders need to be engaged such as parents, ward counsellors etc. It also implies that due to the lack of support from these bodies (parents and ward counsellors), the learning and teaching of EE is affected.

Sustaining Reading First (2009) states that the inclusion of various stakeholders in the teaching and learning process is vital as it enhances learners' performance. Maluleke (2014) emphasises the importance of parental involvement in their child's education by stating that in schools, parental involvement helps parents to discover their potential, which they can use for the

benefit of their children. This would take away the heavy burden from the teachers' shoulders as they share responsibilities with the parents and community representatives. However, the question arises as to how to achieve this with parents who have negative attitudes towards the environment? This is a study on its own that the researcher aims to undertake at a later stage. Additionally, Teacher B asserted that outdoor learning and the creation of gardens may contribute to improving EE learning and teaching. She further stated that,

"…*A lot of things must be provided and encourage educational trips*".

She then emphasised the proper planning of educational trips as she mentioned that the planning and organisation of such must be written on paper. This statement implied that the planning of EE content is a problem because all of these activities are expected to have been catered for in the CAPS document. If this was stated or indicated that at this period there needs to be an educational trip in association with these topics, teachers would not have to bear this load of paperwork. Similarly, Hernandez-Cruz and Russell (2016) support this statement by highlighting that too much paperwork given to teachers affects the teaching and learning process.

Teacher C similarly believes that most of the environmental threats that are obseved around the communities lie at the hands of ward counsellors and municipalities for not rendering services to the communities, therefore, to raise awareness, ward counsellors must be consulted to provide primary needs. It is clear that teachers have the same impression that various stakeholders' engagement can improve the teaching and learning of EE. She implied that the non-provision of primary needs to people contributes to negligence around their community. She added that to improve EE, she thinks that it is vital to reduce the amount of content in the NS curriculum as she feels like it is a lot and this would help them to have enough time to teach to the best of their abilities. Additionally, she mentioned that the introduction of ICT in EE classroom lessons should be a priority as she believes that ICT is capable of bringing in what traditional teaching

methods alone cannot bring to the classroom. In corroboration of the earlier mentioned recommendation, Charalambos, Zembylas, Evagorou, Avraamidou and Avari (2007:129) similarly support the use of ICT, as they view ICT as a tool for bringing communities together and enriching methods of communication.

4.7.3.2. Efficient implementation of EE curriculum

There seem to be numerous hindrances facing curriculum implementation. In corroboration of this, Mkandawire (2010) mentions that it is difficult to implement a curriculum successfully if the education system has limited funding capacities. In this study, the hindrances that curriculum implementation in schools face are a lack of content knowledge of teachers, which stems from lack of teacher training and workshops, a lack of adequate resources and insufficient time for teaching and learning. Teachers A and B supported each other by stating that the curriculum is not efficiently implemented due to the fact that there are too many gaps. Teacher A stated that there are too many gaps, such as a lack of resource provision in schools. In corroboration with this study, Zwelibanzi (2016) states that there are still implementation problems such as constraints related to the status and relevance of EE, constraints related to support of active environmental learning and constraints related to learning support materials.

In support of Zwelibanzi's (2016) statement, Teacher C stated that the curriculum of EE was not well implemented because she feels that there are some environmental aspects that have been lost because when talking about the environment it cannot be restricted only to the classroom, which is what is happening now. She also emphasised the need for outdoor education. She highlighted a critical concern of not having anyone enforcing EE content. When subject advisors visit schools, they are only concerned with the curriculum coverage and learner pass rate. This implies that there are no EE subject specialists within the Department of Education (DoE). Therefore, it is important for the DoE to open such opportunities for EE specialists in future.

In contrast, Ngussa and Chizza (2017) believes that the successfulness of curriculum implementation relies on teacher motivation. The researcher therefore

believes that curriculum implementation needs to go hand in hand with practicality. Implementation can be successful when all aspects are covered such as the provision of resources for teaching and learning, teacher training etc. The below section emphasises the importance of the incorporation of EE curriculum in classrooms.

4.7.3.3. Incorporation of EE curriculum in classrooms

One of the requirements of the curriculum is practicality. A curriculum should also contain an element of feasibility. During the face-to-face interviews, it transpired that an EE curriculum is not practical because of a number of circumstances. Teacher B pointed out that EE is not incorporated enough because it covers theory the most. She stated that,

"…*No! It is not enough because it covers the theory mostly, it only talks about what is written in books, as for going outdoors it is not possible*".

It seems as if the curriculum of EE in these schools is mainly focused on theory and not on practical activities. The researcher believes that there should be a balance in the curriculum, as such it should not be biased towards theory only. Wrenn and Wrenn (2009) corroborate this by stating that practical activities show the abilities and skills of a learner.

On the same note, Teacher C stated that an EE curriculum is not practical as learners have lost some environmental aspects because, as far as EE is discussed, it cannot be restricted to a classroom or school context alone. It is crucial that EE is extended from schools to communities, and from communities to a global context. De Lange (2004) states that EE should be extended beyond the classroom context to address local environmental crises. If the knowledge of EE is shared globally, it can aid in solving global environmental issues.

Teacher A stated that the EE curriculum was not well incorporated as the curriculum is not relevant for their schools' environment, as their school falls

under a low socio-economic background because their school is designated in a rural area and there are a lot of things which affect the curriculum in their school, such as inadequate learning and teaching facilities and limited classrooms. In corroboration with this, Norman (2016) states that the curriculum between low and high socio-economic backgrounds tend to differ, in particular to the level of teaching aids available in schools with a high socio-economic background compared the schools with a low socio-economic background.

4.7.4. THEME 3: Influence of Environmental Education

This section aims to interpret the impacts that EE have on learners and on teachers. Under this theme various categories emerged, namely: shaping learners' behaviour and the influence of EE in individuals; sustaining the environment and the role of EE in mitigating environmental threats.

4.7.4.1. Shaping learners' behaviour and the influence of EE on individuals

Learner behaviour is mostly shaped by their teachers and parents or other elderly people in a community and it is important to teach them while they are still young. Seifert and Sutton (2009) corroborate that teaching learners responsible behaviour should be done at an early age. All three schools (A, B & C) seem to be concerned about promoting learners' good behaviours. In school A, it emerged that bad behaviour should be reported to seniors. One learner, during the focus group interview, stated that learners who litter must be reported to a teacher. Another learner stated that a learner must be reported to the principal so that he/she will be punished. In School C, it transpired that caring and the picking up of litter is the responsibility of caretakers, as after every break they walk around picking up litter. This means that a lot of work still needs to be done because learners are ignorant of the effects they have on the environment.Teacher C stated that caring for the environment is the caretaker's responsibility. In this study a caretaker is someone who cleans and takes care of the school grounds and classrooms. At a school level, seniors' involvement can play a significant role in shaping learner's behaviour when it comes to environmental issues.

Ntanos, Kyriakopoulos, Arabatzis, Palios and Chilikias (2018) corroborate that it becomes evident that school and family backgrounds are expected to play a key role in assisting learners to overcome future challenges. Therefore, if seniors can be engaged and play a vital role in ensuring that the school environment is well taken care of, learners can adopt those strategies and put them to practice outside of school.The school, society and families are inseparable, hence it is vital to understand how EE affects and influences people in different contexts. In School A, one learner stated that EE,

"…*Teaches us not to pollute the environment of the communities in which we live in and protect them*".

The conclusion that can be drawn from this statement is that EE cannot be expected to be covered at a school level only, and the society must also be involve in all aspects of EE. Expecting learners to incorporate EE is expected to yield positive results in developing good behaviour towards the environment. However, qualitative data of this study shows that EE does not have much of an impact on learners' behaviour. On the same note, Teacher B stated that,

"…*There is, but it is not something you can do alone or as an individual, it is something that we all need to do, by the way things are happening I do not see much change*".

Currently, EE does not seem to play a significant role in changing learner's behaviour. In line with the findings of this study, Li (2018) stated that EE must have effect on learners to enhance environmentally-friendly attitude towards learners. On the same note, Teacher C stated that there is no impact as learners may not be aware of their actions towards the environment. The statement of Teacher C contradicts what learners have said, because learners have shown that they do have knowledge of what causes environmental problems.

4.7.4.2. Sustaining the environment and the role of EE in mitigating environmental threats

This section addresses issues raised pertaining to achieving a sustainable environment. It is important to sustain whatever nature has provided without compromising the needs of future generations (Blowers, Boersema & Martin, 2012). All schools' qualitative results analysis reveal that there is an understanding of sustaining environment by not polluting, littering and discarding waste. Learners seem to have observed numerous environmental problems in their environment, as learners in School A were able to identify littering and the burning of fossil fuels as environmental problems. In support, Perera (2017) states that burning fossil fuels is one of the most recognised environmental threats as it leads to pollution. Learners feel that a solution for littering is through recycling. On the same note, School B and C learners stated that they have witnessed littering as environmental threats and this problem can be solved through recycling. Grigore (2017), in support of this, stated that recycling is a remarkable solution to solve the littering problem. The researcher thinks that the fact that learners understand the meaning of recycling and striving for sustaining the environment exposes them to entrepreneurial opportunities. In SA, recycling is a recognised business (DEA, 2016). These learners seem to be aware of environmental threats that exist in their communities and they understand which environmental conservation strategies need to be taken. One learner in School A was able to link EE with health education through his response, as he stated that people who live in an unhealthy environment tend to fall ill. In support of this, another learner from School C stated that people fall ill because they inhale the pollutants and microbes in the air that cause illness. These learners understands what an unclean environment could do to their health and other people. Apart from recycling, one learner asserted that they could form a group as learners to clean and collect waste in the affected areas. These learners comprehend that in order to solve environmental problems an individual cannot do it alone, and needs support from other people. Harring, Torbjornsson and Lundholm (2018) state that to solve environmental problems, citizens and nations need to join together. Nations can join together in mitigating environmental problems through EE.

One learner in School A stated that EE has influenced them by teaching them where and how to dispose of waste. One learner in School C supported the

learner in School A by also stating that EE has influenced them through teaching them never to throw waste anywhere they please. Another learner mentioned that EE assisted,

"…*To show us the consequences of an unclean and unhealthy environment*".

In these schools, learners seem to know how to conserve the environment. However, the question arises as to why learners do not seem to put what they have spoken about into practice? Could it be because learners are not motivated? The researcher thinks that learners lack motivation, which could be from teachers, parents and educational bodies. In corroboration to this statement, Vero and Puka (2017) state that motivation has several effects on student's learning and behaviour. They further alluded that motivation directs behaviour towards particular goals (Vero & Puka, 2017). This shows that motivation on EE learning can enhance good behaviour, meaning that the outcome of learner's bad environmental behaviour is a result of no motivation.

A learner in School B stressed the importance of acquiring EE knowledge in school, as she stated that acquiring this knowledge has helped them to discern this information to their family members and communities. Another learner in School C supported a learner in School A as she stated that EE has influenced them by equipping them with skills to teach their family members how to look after and take care of the environment. This emphasises the need of EE as it does not only benefit the school, but also families and communities at large. On the same note, a learner in School C stated that environmental threats can be mitigated through holding a meeting for environmental awareness where people will be taught how to cater for their environment. Lizuka (2000) stresses the role of environmental awareness and pro-environmental actions that play a crucial role in making environmental policy successful. It emerged in this study that environmental awareness has a significant role to play when environmental policies are developed.

During observations it transpired that the impact of EE should include, but not be limited to, changing behaviour. In School A and B, learners showed knowledge regarding environmental issues and conservational strategies, however if these learners could receive motivation, their learning could be enhanced and their behaviour can be changed. It transpired from the data that teachers' attitudes play a vital role in changing the behaviour of learners. In support of this, Cappy (2016) stated that teachers are agents of social change in schools in SA. Therefore, teachers are expected through their teachings to enact change in learners' lives. However, in School C, learners and teachers portray no signs of EE having an impact in their lives because they hire people to clean the school and to pick up litter. It seems as if teachers and learners in this school do not want to partake in environmental conservation and view environmental conservancy as other people's responsibility. From this section it transpired that the schools' infrastructure plays an essential role in motivating and the encouragement of learners and teachers to excel in their abilities on caring for the institutions and community environments and the world as a whole.

4.7.5. THEME 4: Challenges which hindered the teaching and learning process

In this section, three categories emerged under this theme, namely the challenges of learning EE, the challenges of teaching EE and strategies to overcome the challenges of teaching and learning EE.

4.7.5.1. Challenges of learning EE

This section aims to explore the challenges which hinder the teaching and learning process in the classroom. During focus group interviews, learners in School A mentioned that they have encountered numerous challenges when learning EE. The first challenge that one learner mentioned is that when learning EE,

"…We cannot touch and feel the things that we learn about".

One learner in School B corroborated with the learner in School A by stating that,

"…Not having direct interaction with the things learnt about in the curriculum".

While another learner stated that their second challenge was a lack of resources. This shows that learners' interactions with the aspects they learn about is vital. Yildirim and Akamca (2017) authenticate this by stating that outdoor education allows learners to have a wide perspective about aspects because there is a wide world surrounding them outside. The third challenge stated by another learner in School A is that they only learn from a textbook. With EE learning and teaching, textbooks alone do not seem to be a conducive learning and teaching tool as it limits participation. In support, Seisto, Federley, Kuula and Vihavainen (2010) state that textbooks alone are not enough.

Learners in School A and B believe that the challenges which hinder the teaching and learning in their school is because they always learn inside the classroom and from a textbook, and as such they do not get a chance to go out, touch and feel the aspects they learn about because they are limited to a classroom environment. Miller (2017) states that the outdoors can provide easily accessible contexts for content of interest. This shows that outdoor education needs to be incorporated in schools as it allows learners to have experiences from their interactions with nature. Learners in School C tend to differ, as one learner mentioned a fourth challenge of not having enough information on the topics they learn about. This showed that there is lack of content knowledge from teachers because learners cannot lack knowledge if their teachers are providing them with sufficient knowledge. Sadler, Sonnert, Coyle, Cook-Smith and Miller-Friedmann (2013) state that teachers cannot help learners learn about certain topics they themselves do not understand. Therefore, it transpires that learners do not receive enough information, it clearly points to the source of information, which are teachers.

4.7.5.2. Challenges of teaching EE

This section is aimed at exploring the challenges which hinder the teaching of EE in schools. It transpired during face-to-face interviews that the first challenge experienced by teachers is a lack of incorporation of EE curriculum in the

classroom, which hinders the teaching process as teachers mention that it is because it was not implemented successfully. Teacher A states that it was not well implemented because,

"…*There are too many gaps, even though it was integrated in all subjects, but I think it needs its own time and be a subject on its own".*

Similarly, Teacher B stated that EE was not well implemented as the curriculum of EE relies mostly on theory only and no practical work after teaching and learning. It was stated by Teacher B that,

"…It covers theory mostly and it talks about what is written on the books".

Teacher C also stated that EE was not well implemented because there are some environmental aspects that they have lost,

"…Because when we talk about the environment we cannot restrict it into a classroom, which is what is happening now and you see that there are a lot of things that learners are missing out".

She further mentioned that EE needs to be expanded in secondary schools because they are given minimal time as they are pressured to finish the curriculum. She added that no one is enforcing it and no one will ask as to whether they have done something or not because it seems unimportant to the curriculum developers and to teachers. Teacher C feels like EE is not successfully implemented because it seems like the EE curriculum is limited to a classroom environment. Teacher C mentioned that the second, third and fourth challenges that she has recognised are a lack of time, lack of resources, being pressured to finish curriculum and ending up not teaching EE to the best ability as a teacher. In agreement with these challenges, Rahman, Halim, Ahmad and Soh (2018) in their study discovered that teachers are challenged by time constraints, which shows that time constraints have been a challenge throughout the implementation of EE.

Teacher A further mentioned the gap relating to a lack of teacher training as an implementation problem. In corroboration with Badugela (2012), he stated that curriculum implementation has proven problematic to the culture of teaching and learning in various South African schools due to a lack of teachers' continued development. A fifth challenge mentioned by Teacher A was of the unavailability of environmental clubs in schools, Teacher A mentioned that there is no environmental club because when they come to school the first period starts and there is no time. Environmental clubs are a platform through which learners can learn to take responsibility to live in a sustainable manner and improve their environmental leadership skills (Tlhagale, 2004). Teacher B also validates this by mentioning that in her school there is no environmental club and there has never been one before. Teacher C stated that while there is an environmental club on paper to show the departmental team that they have some activities going on in their school as she is part of it, it has never actually been functional. This statement shows that there is a disinterested stance among teachers as they do not fulfill their responsibilities. If something is on paper such as the functionality of an environmental club in the school plan, teachers should ensure that it is put into practice. This then raises question of whether learners are motivated to establish these clubs or not. If teachers fail to establish these clubs how can learners learn from them? Teachers need to understand their roles so that they can fulfill their responsibilities. Radhakrishnan (2018) justifies that it is imperative for teachers to understand their roles. However, in these schools there seem to be no functional environmental clubs. Wanjiru (2011) validates that school environmental clubs offer a valuable opportunity to reinforce the topics and the facts taught in the curriculum.

Teacher B further stated there are certain topics which demand to be taught outside of the classroom, but outdoor education is almost impossible to implement and going on environmental educational tours do not frequently occur. However, Teacher C's implications seem to be aligned with Teacher B when she states that it is not practical,

"…Firstly, learners loves going out and see those things, there is no outdoor education in NS curriculum or maybe it depends on how each teacher plans it in their lesson plan".

Teacher B further stated that the EE curriculum should be improved to include field trips whereby learners and teachers would go on tour to explore the environment at large. Teacher C stated that on her side, she has never taken learners out of the classroom, but she is of the idea that learners should be taken out because learners enjoy the things that they are learning about and this can intrigue learners' interest to listen and understand the topic which will enable learners to see that the aspects they learn about are closer to them and thus they would not separate themselves from environmental aspects. Teacher C mentioned that most learners enjoy outdoor education and it is important that this is taken into consideration during curriculum development. Brookes (1989) mentioned that many good teachers conduct outdoor education activities. Yildirim and Akamca (2017) confirm that outdoor education allows learners and teachers to interact with nature and is of great importance for childhood development as outdoor play spaces support interaction. Teacher B further stated that they have encountered challenges such as,

"…*Other learners get bored on other environmental topics like gases because they do not see them".*

She further added that there is a lack of interest from learners as they tend to get bored on certain environmental topics. In line with this statement, Thomas (2015), in his study, stated that learners seem to feel underappreciated and unloved by most teachers, who are either very rough or their teaching style does not suggest the warmth and caring that should characterise such a special and important relationship.

During observations, a lot of aspects such as a lack of teaching resources, lack of content knowledge in teachers, lack of enthusiasm to raise awareness, lack of time during the school day and changing careless behaviour to environmentally-friendly behaviour in these three schools have been observed as hindrances in

the teaching and learning process of EE. These findings are in line with the findings of Ham and Sewing (1988), as they also discovered that amongst teachers, there are conceptual barriers which stem from a lack of consensus about the scope and content of EE; logistical barriers which stem from perceived lack of time, funding and resources; educational barriers which stem from teachers' misgivings about their own competence to conduct EE programs and attitudinal barriers which stem from teachers' attitudes about EE and science instruction. In School A, a lack of resources hinders the teaching and learning process in the classroom, as is was confirmed by a teacher in this school during a face-to-face interview. On the same note, in School B there are no charts, pictures or samples in the classroom, and it was observed that these are the elements which hinder teaching and learning in this school. Even lights in the classroom were not working. In School C, they lack teaching aids which are appropriate for the lesson being taught, lack resources and struggle with time management. The time allocated to teach lessons are short which makes teachers pressured to complete the lesson even though there were more aspects which needed to be covered.

Through observations it transpired that there was another challenge to integration in South African schools. Because of EE having been infused in the curriculum of other subjects, teachers are unaware of environmental topics and how they should approach them in their teachings. In such a way, Teacher C had to first ask the researcher what EE is as well as its purpose. Mwangangi (2012) endorsed that because of EE exclusion in the curriculum, with the argument that it is infused, it has received minimal attention by both teachers and learners, however, as a result, the level of environmental awareness among learners in schools remains low.

4.7.5.3. Strategies to overcome challenges of teaching and learning EE

There are numerous challenges encountered by teachers and learners when teaching and learning EE. It transpired during focus groups that the absence of interaction with nature or rather aspects learning about hinders the learning process, as stated by learners in School A and B. In order to overcome this

challenge, learners ought to be taken outside as outdoor education equips learners with different skills and experiences with nature. Becker, Lauterbach, Spengler, Dettweiler and Mess (2017) authenticate that outdoor education increases school performance as it is healthy, supports child development, fun, helps develop a sense of place, civic attitudes and behaviors and engages families and the community. Another challenge mentioned by a learner in School A is a lack of teaching resources. The provision of resources is a huge challenge in schools that teachers and learners are facing. In the case of a lack of resources, there are still many forms in which learning and teaching can be enhanced, such as motivation of participatory learning and teaching. Teachers can engage learners more in the teaching and learning process through the introduction of activities which challenge learners to be creative and to think critically.

Miles (2000) stated that the lack of resources stems from inadequate state provision. In support of this, Beck (2014) suggests a number of tips to overcome barriers in relation to resource scarcity. She suggested the establishment of group activities, making use of the chalkboard, using flip-charts and bringing laptops to the classroom (ICT). Learners also mentioned learning from a textbook alone. Teachers need to introduce other advanced teaching materials into the classroom such as videos, and organise educational trips to enhance learning and teaching. In line with these findings, Coe, Aloisi, Higgins and Major (2014) stress the need for introducing new learning known as “scaffolding”, the provision of resources and space. On the same note, it transpired during focus groups that learners feel that they do not receive enough information about the aspects they learn about. This challenge can be addressed through the provision of teacher training and workshops. Boudersa (2016) confirms that teacher training and professional development are seen as central mechanisms for the improvement of teachers’ content knowledge and their teaching skills and practices in order to meet high educational standards. In line with the findings of this study, in a study by Ketlhoilwe (2007), it was discovered that teachers noted that some objectives in the curriculum are not clear and need to be revisited.

However, during face-to-face interviews it transpired that teachers find the EE curriculum not practical in the classroom, which draws back to the incorporation of outdoor education. The practicality of EE curriculum should be evaluated through the establishment of greening school committees and so on. However, since in these schools environmental clubs are not functional, if not non-existent, it clearly shows that an EE curriculum is not practical in these schools. Conde and Sanchez (2010) confirm that the integration of EE is still a topic of concern. It was further mentioned by Teachers A, B and C that EE was not well implemented. Ketlhoilwe (2007) affirms that the implementation of EE has had numerous barriers, namely language barrier and teacher trainings, and it was stated that the incorporation of teacher training and workshops can improve the implementation strategy of EE. It was mentioned by Teacher B that the learners sometimes get bored when studying EE. It emerged that persuading learners to participate in class discussions can assist teachers to overcome challenges in the teaching of EE. Similarly, class discussions are recognised as a successful tool to actively engage learners in the learning process (Cherif, Harris & Murphy, 2017). However, teacher C highlighted the issue of time constraints and a lack of resources, which present more challenges in teaching EE. Teacher C stated that,

"…Lack of time, pressed to finish curriculum and end up not teaching EE at your best of ability and to the best of the learners. I do not know how I have overcome them, we are just swimming, and we just do it, seriously".

By looking at Teacher C's response, the researcher thinks that EE can be taught and learnt to the best ability of the teacher and learner when the time given and the resources are enough. Therefore, it is crucial that adequate resources are presented in the classrooms. Bizimana and Orodho (2014) in support of this, stated that schools with enough learning and teaching resources tend to have higher academic achievements compared to schools with less, learning and teaching resources.

4.8. SYNTHESIS OF THE STUDY

This section aims to synthesise the findings of this study based on the critical research sub-questions. It emerged from qualitative data that all schools were under-resourced, which negatively impacted the integration of EE. It also transpired that knowledge of EE should be extended beyond classroom situations. The synthesis of this study has been discussed according to the sub-research questions.

The first research question: What are the teachers and learners' perceptions of EE and ESD?

The findings of this study show that even though the teachers agree on the meaning of EE, they do not view the integration of EE in the same way. This study focussed on teachers' awareness of EE being integrated in the subject of Natural Science (NS) and on learners' knowledge about their environment and what surrounds them as well as learners' awareness of EE. The teachers seem unsure as to whether or not EE was successfully implemented and whether the integration of EE across all subjects is efficient, as during the face-to-face interviews, it transpired from the response of one teacher that EE was not supposed to be integrated because it needs its own time as a separate subject. Another teacher supported this statement by arguing that, sometimes they are not even aware of whether they are teaching EE topics because it is not clearly stated in the CAPS documents.

This study suggests that it would be better if training or guidance on the teaching and learning of EE was provided because it does not seem as if there is any guidance in the policy document currently. Based on the response of one teacher, who stated that no one is enforcing the teaching of EE, different practices such as teacher training should be exercised to extend the knowledge of EE amongst teachers and learners, because anything that involves the environment touches every life on earth and there should be environmental specialists among the departmental staff who will oversee the teaching and learning of EE. Most teachers and learners focussed on developing knowledge of the environment and education for sustainability. The assumption of Funke (2017) is that knowledge is the basis for other levels of thinking and taking action.

First, knowledge is gained, then a decision to take action for the environment on the basis of the knowledge acquired can be made. On the basis of these findings, it can be concluded that teachers perceive EE and ESD differently from learners. This is because teachers have different experiences and exposures to the environmental settings, which plays a large role on their perceptions (Kimaryo, 2011).

Through observation it has been shown that teachers and learners are not aware that they are actually teaching and learning about EE in other subjects because the topics are clustered together with other topics and they can only realise that they are actually talking about the environment when they are making examples. The findings of this study reveal that there is a wide gap that still needs to be filled, and that the integration of EE was not successful because in one of the schools, one teacher mentioned that because of this integration the learners end up missing out on a lot of environmental aspects as the topics are not clearly indicated. Another teacher agreed that EE needs its own time because it is important for everyone to know about their surroundings. The researcher agrees with them because they have observed, through their own teachings of the EE topic in the school where they work, that it is not indicated that the topics are meant for environmental learning and the objectives do not say anything about learning about the environment. However, the theory of Bandura (1971) emphasises that in social learning systems, new patterns of behaviour can be acquired through direct experience or by observing the behaviour of others, therefore the findings of this study show that the subject knowledge of teachers needs to be improved so that learners will be equipped with the necessary environmental skills to change their behaviour.

This section revealed that the content of EE is not clearly indicated in the policy document, there are implementation problems and the importance of EE being a separate subject.

The second research question: What are the teachers' teaching practices used to effectively teach EE?

This study revealed that the teaching practices are not in line with the purpose of EE, which is to equip every citizen with skills to take care of their environment which would challenge them to make adequate decisions that would positively impact their future (UNESCO-UNEP, 1985). One teacher mentioned that some environmental aspects are lost because EE is restricted to a classroom environment and sometimes they do not even have charts as teaching and learning samples, therefore learners do not see the aspects that they learn about as they are not taken out of the classroom.

However, it was suggested by learners that outdoor education can improve the teaching and learning of EE as they could easily interact with nature. The use of textbooks alone in the classroom was said to be another practice that is employed by teachers. It was suggested by another teacher that samples need to be introduced in the classroom apart from outdoor education. The theory of Bandura (1971) states that learning by direct experience is governed by rewarding and punishing consequences which follow any given action. Therefore, this study promotes learning through direct experiences, where learners explore nature outside the classroom and teachers should be able to motivate learners through the creation of competitions, campaigns and other activities which could promote learner engagement in building environmental awareness.

This section emphasised the importance of outdoor education, as it enhances the learning of EE and in this study it has been found that EE is restricted. The provision of teaching aids in the classroom and the promotion of EE through competitions, campaigns and other environmental activities is required.

The third research question: How learners perceive the learning and teaching of EE?

This research question was addressed through the presentation of scenarios where learners were requested to suggest ways in which they can solve environmental issues. In that way they would successfully show their knowledge content and be able to apply skills they have learnt in school. Although many

learners provided responses, most of their responses revealed that they were unsure regarding what they would do if they were to find themselves in those situations, such as having to deal with other learners' irresponsible behaviour towards the environment. Therefore, the findings point to a lack of knowledge on how to mitigate environmental issues.

Thus far, the findings of this study point out that teachers have to play a vital role in ensuring that learners are equipped with skills that they can use outside the classroom without doubting themselves. This study reveals that learners perceive the learning and teaching of EE differently from teachers, because learners view learning about EE as something that can teach them ways to solve existing problems, yet they see it as the responsibility of other people in the communities, while teachers see EE as a lifelong solution to the existing and upcoming problems of the generations to come. However, this study shows that the learning and teaching of EE is a lifelong solution to the existing and far coming environmental problems and a tool to improve lives as well as an opportunity to create more jobs throughout nations. Similarly, the theory of Bandura (1971) highlights that teachers are the primary agents to pass on knowledge to learners, as learners view them as models. Therefore, teachers should model environmentally-friendly behaviour which their learners can imitate.

According to the synthesis of this section, learners seemed unsure of the environmental knowledge they have acquired and how they can put it into practice. The importance of the teachers' role in the learning and teaching of EE content was also discussed.

The fourth research question: How does the teaching of EE influence learner's behaviour?

This research revealed that even though EE has been integrated in all subjects, it has little influence, if any, in shaping learners' behaviour towards their environment. The researcher believes that when knowledge has been acquired, behaviour change is vital. If there is no change of behaviour, it means that adequate learning has not taken place (Christie, 2008). The role of EE in

mitigating environmentally threatening factors is well known, however it seems as if teachers do not understand the role of EE because they do not know how they would solve environmental issues they see in their communities. The researcher is of the opinion that you cannot teach something that you do not know yourself. This study highlights that teachers lack the skills and they were not trained for the integration of EE, therefore the attitudes of the learners seem unfeasible to be changed by people whose attitudes have also not been changed, as change starts with one person (teacher) in order to impart it onto other people (learners).

Bandura (1971) states that people learn by observing the models presented to them, therefore, in this case teachers are seen as models, meaning that learners tend to reflect what they see their teachers doing, and as such in most schools there are no environmental clubs, particularly in the three schools where this study was conducted. In one school, there is an environmental club but only on paper but it is not functional, which shows that teachers have a negative attitude towards the environment, and one teacher supported this statement by stating that no one is enforcing it because it is seen as unimportant by the teachers, school management and even departmental staff.

This section focussed on the influence of EE in the life of the learner and in changing their behaviour towards the environment. This section revealed that it is important for teachers to have an environmentally-friendly behaviour so that learners can learn from them.

The fifth research question: What are the challenges that teachers and learners come across which hinders effective teaching and learning of EE?

A number of challenges were brought up by teachers. Most of them touch on the time constraints to teach EE as well as the lack of resources. It clearly shows that even though EE has been integrated for many years, nothing much has been done to improve it. One of the teachers suggested that EE should be a subject on its own so that it will have its own time to be taught and learnt which will give teachers and learners enough time for practical work to be done outside of the

classroom which will allow learners to have first-hand contact with the environment. The teachers' experiences of teaching EE are different, as some teachers would teach EE through bringing familiar examples to the classroom and others would teach EE as a topic in the classroom. The teachers are still unsure as to whether they are teaching EE correctly as there is no guidance on how EE should be taught, and some teachers are not even aware that they are teaching EE because they do not know the topics of EE. So far it seems like the challenges of teachers are the same in these three schools and this study illustrates that in addressing these challenges, the Department of Education (DoE) can play a massive role in ensuring that the schools have all of the supporting materials required for teaching and learning and ensuring that before they release a new clause they involve teachers because they are the ones who interact with learners and thus know what is best for their learners and what will not work. It was suggested by one teacher during face-to-face interviews that the adoption of ICT in the classroom may be a great tool to teach EE so that even if learners are not taken out into the environment, the environment is brought to them by using technology.

According to Bandura (1971), learners learn from the people they view as role models. In this case, teachers are seen as models to learners as learners imitate the actions of their teachers towards the environment. From the responses of teachers in the schools, they lack EE knowledge, therefore it is difficult to expect positive results from learners who are taught by these teachers. However, Vygotsky's theory (1978) asserts that social interaction can play a significant role in cognitive development in which development precedes learning. In Vygotsky's theory, there are three main themes, namely social interaction, the more knowledgeable other (MKO) and the zone of proximal development. In the sense of a more knowledgeable other, it is normally thought of as being a teacher or any other adult, but it can also be a peer or a computer programme, and in the sense of zone of proximal development (ZPD), according to Vygotsky (1978), all learning taking place in this zone focusses on the interactions or connections between people. The findings of this study show that learners sometimes learn from each other, as even if the teachers may be cautious on the environment, learners could still learn negative behaviours from their peers and be ignorant of

the environment. When conducting the focus group, there was a question regarding what learners would do if another learner or a group of learners continue to litter even after being taught. Most of them said that they would speak to the learner/learners and make them aware of the implications of their actions, which would lead to these learners learning from his/her peers about how important the environment is by having a conversation with them.

This research reveals that training of teachers is needed and enough resources must be provided to schools. Use of technology must be adopted, and field trips must be planned as well as teaching aids presented into the classroom. It was revealed that there is a link between health education and EE and these two cannot be separated because caring for the environment prevents many health problems as well.

4.9. SUMMARY OF THE CHAPTER

This chapter focusses on qualitative data presentation, analysis and interpretation. The findings of this study indicate that teachers lack content knowledge to teach EE. Therefore, thorough training needs to be provided by the department. This study revealed that when teachers are equipped with skills, they are able to pass on their knowledge to learners successfully and will be enabled to model environmentally friendly behaviour which learners can imitate. The findings also indicate that learners, together with their teachers as well as school management, do not see EE as an important aspect in learning and teaching. This study points out that insufficient teaching and learning resources hinders the process of learning and teaching, therefore it is crucial that enough resources are provided in schools. This study emphasises the importance of outdoor education in the teaching and learning of EE, as this is another form of engaging learners in the learning process when they interact with nature.

CHAPTER 5
SUMMARY, IMPLICATIONS, RECOMMENDATIONS AND CONCLUSIONS

5. 1. INTRODUCTION

This chapter discusses the conclusions and recommendations resulting from the findings of this research on teachers and learners' perceptions towards the integration of Environmental Education (EE) in classrooms in Kwa-Zulu Natal (KZN). The conclusions are based on the rationale, purpose, research questions, aim and findings of the study. The recommendations of the study will also be discussed based on the purpose and conclusions of the study.

5.2. STUDY OVERVIEW

This study consists of five interrelated chapters which will be briefly discussed in this section.

Chapter 1

This chapter introduced and discussed the rationale of the study. Furthermore, it discussed the problem statement, stated the research questions which the study aims to answer, the objectives and aim of the study. The context of the study, limitations and delimitations, ethical considerations and concepts of the study were also discussed in this chapter.

Chapter 2

In this chapter literature was consulted and reviewed. A theoretical framework was then formulated for this study, namely social learning theory. The gaps in other studies which this study aims to fill were identified by this study, such as that most studies concentrated on EE teachers' perceptions and not on learners.

Chapter 3

This chapter discusses the research methodology of the study, which is a qualitative approach, a research design of a multiple case study, data collection techniques, which are focus groups with 24 learners, face-to-face interviews with

three teachers and observations in three different secondary schools and it discussed how trustworthiness of the study was maintained.

Chapter 4

In this chapter the findings of the pilot study were discussed and data collected by each data collection tool was presented in the form of themes which emerged from the data collected. Data analysis, interpretation and discussion of the findings followed.

Chapter 5

This chapter discusses the overview of the chapter, summary of the findings, implications of the study, gaps to be filled by this study, recommendations and limitations of the study and draws a conclusion of the study.

5.3. SUMMARY OF THE FINDINGS

The findings of the study were discussed according to the research questions of the study. The main research question to be answered by this study was; **What are teachers and learners' perceptions on the integration of EE in the classroom?**

5.3.1. The first research question: What are teachers and learners' perceptions of EE and ESD?

Regarding perceptions on environmental exposure, teachers and learners had knowledge about the environment, yet their perception was limited to a context of caring for the environment, and it was not broadened further. This study was on teachers and learners' perceptions towards the integration of EE in the classroom and has found that teachers are overloaded with their work. Therefore, they cannot teach EE to the best of their ability as stated by one teacher. A lack of resources also contributes to the lack of EE knowledge. This study has revealed that there are not enough teaching resources to teach EE which leads to a lack of EE knowledge to teachers and learners. This statement was supported by two teachers who said that they do not have enough resources to teach EE in the classroom. However, the opinion of one teacher tended to

differ, as she stated that sometimes they do have charts to display, however she did show one regarding the solar system, but as teachers they become lazy because of the excessive amount of work they need to cover. It transpired that EE topics are not clearly spelled out in the CAPS document. Teachers also stated that they are not motivated by school heads and department representatives, as one teacher stated that no one is enforcing the teaching and learning of EE. Teachers perceive EE differently from learners, as teachers teach EE in the classroom for the purpose of learners having to write examinations and pass on to the next grade, while learners view EE as an opportunity to interact with nature, which is in line with the theory of Vygotsky (1978) when he stated that new behaviours are learnt through having an experience directly.

5.3.2. The second research question: What are teachers' teaching practices used to effectively teach EE?

This study revealed that teachers are still using old missionary styles of teaching, whereby learners are taught everything that pertains to their environment in a classroom setting through the use of textbooks and they do not interact with their environment while learning. They have to imagine what the teacher is referring to. This study also revealed that the idea of outdoor education seemed like an old fashion way of teaching, as learners are no longer taken outside and the idea of learners working in schools has been banned by the DoE as mentioned by one teacher. Now learners only learn inside the classroom which leads to learners becoming bored and exhausted as they are not challenged. It was said by one teacher that in the past, learners were taken outside and at that time there were gardens in the schools, but the DoE has banned that system as they said learners only came to school to learn and not to work. This study also concluded that by the actions of the DoE, it seems that learning by doing has been removed from the system, but from an EE perspective it has been removed because EE teaches learners about their environment and it is expected that learners practice in a real life setting on how to care for their environment, therefore learners are losing some environmental aspects when learners are taught about the environment inside the classroom yet do not interact with it to practice what they have learnt. One teacher stated that it seems like learners only learn to write exams in the current system. This study supports her assertion because it seems

like the DoE is more concerned about theory than practice, while the findings of this study highlight that it should go hand in hand. Bandura (1971) states that learners need to be presented with an opportunity to model the behaviour they are imitating, in this case, learners are not presented with opportunities to model the behaviour as participation seems limited to the classroom.

5.3.3. The third research question: How do learners perceive the teaching and learning of EE?

This findings of this study has revealed that there is a strong link between EE and health education, they go hand in hand and separating these two is not easy. This study aimed to find the influence of EE on learners. However, the findings of this study highlight that teachers are the source of knowledge acquired by learners. Therefore, teachers seem to interpret EE the same way as they know the meaning and what its purpose is, but when it comes to actually fulfilling that purpose it is not done and this leaves a question hanging on what may be the cause of teachers' demotivation in teaching EE? Therefore, further studies need to be conducted. In the sense of learners, this study finds that their influences rely on that of their teachers, although learners also learn from each other, in the same theory, the teacher is more like a bridge which learners use to cross over to in-depth knowledge and participation. If a learner is taught by a demotivated teacher, this tends to influence the learner in a negative way (Bandura, 1971).

5.3.4. The fourth research question: How does the teaching of EE influence learner's behaviour?

According to the findings of this study, the impact of EE should be sustainability, but that does not seem as the case because EE seems like it has no impact on learners and teachers, as even though they teach and learn about the environment, they do not take necessary steps to sustain it. This study has revealed that there is a lack of teacher training on EE, as one teacher during the interview had to ask what EE topics are and then told the researcher that she did not know that she was actually teaching EE because with the integration of EE in other subjects and in the CAPS documents, it is not specified that these are EE topics. With teachers not being trained it makes it difficult to teach EE and

she also shared that with not having EE specialists from the DoE who will check the EE curriculum as with other subjects, it makes EE seem unimportant to the system of education. However, Bandura (1971) stated that learners learn through the observation of the models' behaviour, therefore having teachers who lack the skills of EE and enthusiasm may be the cause for EE not influencing the lives of learners.

5.3.5. The fifth research question: What challenges do teachers and learners come across which hinders effective learning and teaching of EE?

Teachers face a number of challenges in teaching EE, as they lack content knowledge of EE and integration trainings are not provided to them, there is a lack of resources, lack of time and motivation and unclear EE curriculum topics. This study also revealed that teachers and learners lack enthusiasm to take action towards sustaining and taking care of their environment, even though they might know ways on how to mitigate environmental threats. There was a question that was asked of teachers on what they would do to mitigate the environmental threats they have noticed in their communities or around the school, whereby most teachers stated that there is nothing they can do as they stay in a rural area and community members are ignorant. On the other hand, one teacher mentioned that she does not plan to do anything because this is beyond her control and it needs the "bigger bodies", which she referred to as government and municipality members. In the focus groups, learners mentioned that they would call municipality people to clean dumping sites. By looking at their responses this study concluded that they are not keen to take any action to solve the environmental problems that they are facing and they view environmental sustainability as other people's responsibility. This is happening because there is no form of motivation from the government. As Bandura (1971) emphasises the modelling process, this study revealed that modelling should start from the upper level, which is the DoE, down to principals, teachers and learners. Vygotsky (1978) emphasises that in his theory, teachers are viewed as the more knowledgeable other who learners look up to, therefore when teachers are not keen to take charge of environmental sustainability, learners will do the same.

5.4. IMPLICATIONS OF THE STUDY

The participants of this study seemed worried about insufficient resources as they viewed this as a barrier to learning and teaching. The classroom limitation was also mentioned by the participants and the use of textbooks alone as a form of teaching tool in the classroom seems to be a barrier to learning. However, learners were of the opinion that they would enjoy outdoor education in which they may get a chance to interact with the environment. In the modern era, learners enjoy education more when they learn through the use of innovative technology in the classroom, thus the use of Integrated Computer Technology (ICT) in the classroom can be useful as learners will see the processes of the aspects they learn about. ICT is believed to bring the outside world into the classroom, though this still does not solve the problem of not interacting with nature, however learners at least will have a chance to see aspects that they may not be able to reach. This study has revealed that there is an important role of other stakeholder's involvement such as DoE representatives, principals, school management teams and parents in an EE curriculum. This study revealed that EE should not only be the responsibility of the teachers, but that of other stakeholders. From the teachers' responses and observations, this study has revealed that EE lessons are not prioritised as being important, as there is no form of reinforcement from principals, school management teams and DoE representatives. Further studies need to be conducted to obtain in-depth information on how the curriculum tracking of EE is conducted and who is responsible for that and whether there are EE specialists allocated for the curriculum tracking of EE. In that way there will be an understanding of how the integration of EE can be improved, because at the moment, the integration of EE seems to have loose ends as implementation is not properly carried out.

5.5. RECOMMENDATIONS

This section discusses the recommendations fro integration of EE and recommendations for practice from this study:

5.5.1. Recommendations for Integration of EE

The curriculum of EE should be revisited to enable more concise teaching and learning of EE which will promote actions for change rather than merely learning for knowledge and no initiation after that. This study also recommends thorough planning and organisation of schools' yearly activities, specifically greening activities which involve learners and encourage their participation and environmental competitions. It is recommended by this study to implement environmental clubs in every school which are active and flexible and enough time should be granted to teachers. Learners' needs must also be taken into consideration when developing an EE curriculum.

5.3.1. Recommendations for practice

Some participants also mentioned removing Life Orientation (LO) and replacing it with EE as an independent subject as it educates both teachers and learners about ways to live in their environment. This study recommends bringing back learn by doing and the use of ICT in classrooms for the purpose of EE lessons. This study recommends teacher training on EE, outdoor education to be brought back and encouraging field trips with learners as well as the provision of sufficient teaching materials.

5.6. CONTRIBUTION TO THE BODY OF KNOWLEDGE

This study aimed to fill a gap where most studies are concerned with the perceptions of teachers. Learners' perceptions on EE are not usually investigated even though learners are the future leaders of the country. Therefore, as mentioned in chapter 2, this study provides recommendations on how EE can be effectively delineated in the classroom and assist teachers to develop strategies like initiating environmental clubs, outdoor education that enhance participation and action-based activities to sustain the environment in schools around KZN. This study also highlights the challenges like the provision of resources, EE content knowledge and so on faced by learners when learning EE and recommends how these challenges can be addressed. This study has provided possible solutions such as emphasising the need for ICT in classrooms for the purpose of teaching EE and taking learners outside so that they will have direct interaction with the environment to address in EE learning and teaching.

5.7. LIMITATIONS

There certain limitations to this study such as time, settings of interviews, effects of participants and context of the study.

5.7.1. Time

The time for interviews always seemed inappropriate for teachers because every day the researcher would come to their place of work, she would find them too busy to do interviews and would return home without interviewing them. The time always seemed inappropriate for teachers and learners as the interviews and focus group could only be done within school hours.

5.7.2. Setting of interviews

The interview settings were not flexible enough because in most schools teachers sit together in the staffroom unless if they are going into classes to teach, therefore there were interruptions during interviews from learners and other colleagues. The way learners were supposed to sit during focus groups was not flexible enough as the spaces that were provided were too small and the noise from outside was unbearable since focus groups were conducted during break times.

5.7.3. Effects on participants

In the researcher's and participant's first meeting it was not a pleasant one as the participants seemed to be uncomfortable talking to someone they did not know, especially teachers, because they thought the researcher was just an agent who is there to evaluate them sent by the department. The researcher had to gain their trust first before they would even agree to the interviews. Learners were also uncomfortable as they had thought they would be graded on their responses, which was not the case for this research. Trust was gained from the participants weeks prior the interviews which made participants to provide immerse data without fearing for their identities. Before the commencement of interviews the ethical considerations of the research needed to be explained.

5.7.4. Context of the study

This study was conducted in three rural schools, yet the researcher believes it would have been broader if it had been conducted from at least one rural, one urban and one township school. However, the researcher only had access to these schools and the context of this study was thus only a rural school setting.

5.8. RECOMMENDATIONS FOR FURTHER RESEARCH

This study has recommended for the following future research studies which still need to be conducted to better understand the integration of EE.

- What may be the cause of teachers' demotivation in teaching EE?
- Strategies of EE curriculum implementation.
- Strategies of EE to accommodate learners' needs.
- Opportunities for EE further teacher training.
- Ways to enhance distributed leaders in EE curricula in the 21st century.

5.9. CONCLUSION

This study has concluded that teachers lack training on teaching EE, and theory in schools is viewed as superior to participation. There is no form of motivation from the school heads and DoE representatives. Learners are taught by demotivated teachers who themselves do not have full understanding of EE. This study has also concluded that teachers are overloaded with work and they are not coping, which might be the cause of demotivation. Therefore, their learners are not lenient to the environment as they possess a negligent behaviour towards the environment by littering because they are taught by teachers who are not interested in environmental wellbeing. The findings and recommendations of this study might be useful to guide teachers on how the curriculum should meet the needs of learners in order to have effective teaching and learning of EE and for the learners to gain adequate knowledge of EE.

It is also hoped that the findings of this study will alert the DoE to ensure that there are EE specialists in their department as well as to ensure that integration

is successfully implemented and all teachers are trained in a way that they will gain motivation. By doing so, teachers will be confident enough to pass on the content knowledge acquired. Thus, teachers and learners will be motivated and have their behaviour changed towards the environment and the teachers and learners will then be motivated to take initiation in solving environmental problem facing the world. Hopefully, a new EE curriculum will be issued to allow more concise teaching and learning of EE in future and school laws will be changed so that schools will form environmental committees and keep them running. Based on the previous studies that were conducted on EE integration and their findings, the present research was conducted to explore the perception of teachers and learners towards the integration of EE in classrooms and to determine the challenges that teachers come across when teaching EE, their teaching practices to teach EE and what influence this has on learners. The research questions and objectives of this study have therefore been met.

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APPENDICES

APPENDIX A:
UNIVERSITY OF SOUTH AFRICA ETHICAL CLEARANCE CERTIFICATE

UNISA university of south africa

UNISA COLLEGE OF EDUCATION ETHICS REVIEW COMMITTEE

Date: 2019/03/13

Ref: **2019/03/13/49634062/13/MC**
Name: Ms NP Shabalala
Student: 49634062

Dear Ms Shabalala

Decision: Ethics Approval from 2019/03/13 to 2022/03/13

Researcher(s): Name: Ms NP Shabalala
E-mail address: 49634062@mylife.unisa.ac.za
Telephone: +27 73 572 1539

Supervisor(s): Name: Mr SB Msezane
E-mail address: msezasb@unisa.ac.za
Telephone: +27 21 481 2888

Title of research:

Perceptions of teachers and learners towards the integration of environmental education in the classroom

Qualification: M. Ed in Science & Technology Education

Thank you for the application for research ethics clearance by the UNISA College of Education Ethics Review Committee for the above mentioned research. Ethics approval is granted for the period 2019/03/13 to 2022/03/13.

*The **medium risk** application was reviewed by the Ethics Review Committee on 2019/03/13 in compliance with the UNISA Policy on Research Ethics and the Standard Operating Procedure on Research Ethics Risk Assessment.*

The proposed research may now commence with the provisions that:

1. The researcher(s) will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.

Open Rubric

University of South Africa
Preller Street, Muckleneuk Ridge, City of Tshwane
PO Box 392 UNISA 0003 South Africa
Telephone: +27 12 429 3111 Facsimile: +27 12 429 4150
www.unisa.ac.za

APPENDIX B:

LETTER REQUESTING PERMISSION FROM KZN DEPARTMENT OF EDUCATION TO CONDUCT RESEARCH

UNISA college of education

Request for Permission to Conduct Research in xxxxx Schools.

On the research entitled, "Perceptions of Teachers and Learners towards the Integration of Environmental Education in the Classroom"

Date 31 March 2019

To: The District Manager

Department: xxxx Department of Education District

Tel: xxxxxxxxxxxxxxx

Email: xxxxxxxxxxxxx

Dear xxxxxxxx

I, *Shabalala Nonkanyiso Pamella* I am doing research under supervision of Mr Msezane Sikhulile B., a lecturer in the Department of ABET and Youth Development towards a M Ed at the University of South Africa. We are inviting you to participate in a study entitled "Perceptions of Teachers and Learners towards the Integration of Environmental Education in the Classroom".

The aim of the study is to investigate secondary school teachers and learners perceptions on the integration of EE in the classrooms in KwaZulu Natal. It is aimed at finding out how teachers in public schools interpret and make sense of the integration of EE within the new curriculum and how this impacts on the learners. Your district has been selected because it has the responsibility of ensuring that the learners are taught about their environment and the citizenry that is raised and groomed by the education system is able to mitigate environmental problems and is able to suggest way in which the environment can be saved.

The study will entail interviews with three teachers at the three schools mentioned above, focus group interviews with 24 learners and I will also conduct observations in three selected school, I will observe the Environmental Education lessons and also the behaviour of learners towards the environment in schools whether the EE lessons and teachings have any impacts in their daily activities. The interviews mainly focusses on the practices of teachers in delaminating the Environmental Education curriculum and how this impacts on learners. The benefits of this study lies on the recommendations and contribution on improving the Environmental Education curriculum for the future generation and also recommending practical ways in which teachers can deliver the Environmental Education curricula to learners.

The study has no any kind of risks at all. There will be no incentives or reimbursement for participants in the research. There will be no reimbursement or any incentives for participation in the research. The feedback procedure of the research result will entail follow up telephonic calls and sending feedback using the school addresses or their personal address. If you need further information which would facilitate your decision to participate in this study, please do not hesitate to contact me through +27 73 572 1539 or email nkathy.shabalala@gmail.com. If you need further information on this research you can contact my supervisor- Lecturer Msezane Sikhulile B through +27 12 481 2888 or email msezanesb@unisa.ac.za at University of South Africa (UNISA).

Yours sincerely

Shabalala Nonkanyiso Pamella
Researcher

_____

District Manager
Signature

APPENDIX C
LETTER REQUESTING TO CONDUCT RESEARCH IN SCHOOLS

Request for Permission to Conduct Research at xxxxxxxxx

On the research entitled, "Perceptions of Teachers and Learners towards the Integration of Environmental Education in the Classroom"
Date: 31 March 2019
To: The principal
School: xxxxxxxxxx
Tel: xxxxxxxxxxx

Dear xxxxxxxxx

I, *Shabalala Nonkanyiso Pamella* I am doing research under supervision of Mr Msezane Sikhulile B., a lecturer in the Department of ABET and Youth Development towards a M Ed at the University of South Africa. We are inviting you to participate in a study entitled "Perceptions of Teachers and Learners towards the Integration of Environmental Education in the Classroom".
The aim of the study is to investigate secondary school teachers and learners perceptions on the integration of EE in the classrooms in KwaZulu Natal. It is aimed at finding out how teachers in public schools interpret and make sense of the integration of EE within the new curriculum and how this impacts on the learners. Your school has been selected because it has the responsibility of ensuring that the learners are taught about their environment and the citizenry that is raised and groomed by the education system is able to mitigate environmental problems and is able to suggest way in which the environment can be saved.

The study will entail interviews with three teachers at three different schools and one teacher is selected from your school, focus group interviews with 24 learners

and only 8 learners in a grade 8&9 Natural science is selected from your school and I will also conduct observations in your school, I will observe the Environmental Education lessons and also the behaviour of learners towards the environment in schools whether the EE lessons and teachings have any impacts in their daily activities. The interviews mainly focusses on the practices of teachers in delaminating the Environmental Education curriculum and how this impacts on learners and the interviews will take approximately a maximum of one to two hours to take place at a mutually agreed upon date. The benefits of this study lies on the recommendations and contribution on improving the Environmental Education curriculum for the future generation and also recommending practical ways in which teachers can deliver the Environmental Education curricula to learners.

The study has no any kind of risks at all. There will be no incentives or reimbursement for participants in the research. There will be no reimbursement or any incentives for participation in the research. The feedback procedure of the research result will entail follow up telephonic calls and sending feedback using the school addresses or their personal address. If you need further information which would facilitate your decision to participate in this study, please do not hesitate to contact me through +27 73 572 1539 or email nkathy.shabalala@gmail.com. If you need further information on this research you can contact my supervisor- Lecturer Msezane Sikhulile B through +27 12 481 2888 or email msezanesb@unisa.ac.za at University of South Africa (UNISA).

Yours sincerely

Shabalala Nonkanyiso Pamella
Researcher

_____

Principal Signature

APPENDIX D
LETTER REQUESTING PARTICIPATION

Request for Permission to Conduct Research at xxxxxxxxx

On the research entitled, "Perceptions of Teachers and Learners towards the Integration of Environmental Education in the Classroom"
Date: 31 March 2019
To: The principal
School: xxxxxxxxxx
Tel: xxxxxxxxxxx

Dear xxxxxxxxx

I, *Shabalala Nonkanyiso Pamella* I am doing research under supervision of Mr Msezane Sikhulile B., a lecturer in the Department of ABET and Youth Development towards a M Ed at the University of South Africa. We are inviting you to participate in a study entitled "Perceptions of Teachers and Learners towards the Integration of Environmental Education in the Classroom".
The aim of the study is to investigate secondary school teachers and learners perceptions on the integration of EE in the classrooms in KwaZulu Natal. It is aimed at finding out how teachers in public schools interpret and make sense of the integration of EE within the new curriculum and how this impacts on the learners. Your school has been selected because it has the responsibility of ensuring that the learners are taught about their environment and the citizenry that is raised and groomed by the education system is able to mitigate environmental problems and is able to suggest way in which the environment can be saved.

The study will entail interviews with three teachers at three different schools and one teacher is selected from your school, focus group interviews with 24 learners and only 8 learners in a grade 8&9 Natural science is selected from your school

and I will also conduct observations in your school, I will observe the Environmental Education lessons and also the behaviour of learners towards the environment in schools whether the EE lessons and teachings have any impacts in their daily activities. The interviews mainly focusses on the practices of teachers in delaminating the Environmental Education curriculum and how this impacts on learners and the interviews will take approximately a maximum of one to two hours to take place at a mutually agreed upon date. The benefits of this study lies on the recommendations and contribution on improving the Environmental Education curriculum for the future generation and also recommending practical ways in which teachers can deliver the Environmental Education curricula to learners.

The study has no any kind of risks at all. There will be no incentives or reimbursement for participants in the research. There will be no reimbursement or any incentives for participation in the research. The feedback procedure of the research result will entail follow up telephonic calls and sending feedback using the school addresses or their personal address. If you need further information which would facilitate your decision to participate in this study, please do not hesitate to contact me through +27 73 572 1539 or email nkathy.shabalala@gmail.com. If you need further information on this research you can contact my supervisor- Lecturer Msezane Sikhulile B through +27 12 481 2888 or email msezanesb@unisa.ac.za at University of South Africa (UNISA).

Yours sincerely

Shabalala Nonkanyiso Pamella
Researcher

_____

Teacher signature
Signature

A letter requesting consent of learners to participate in Focus Group Interviews

Date: _____

Title: "Perceptions of Teachers and Learners towards the Integration of Environmental Education in the Classrooms".

Dear prospective participant

I, *Shabalala Nonkanyiso Pamella*, an M Ed student at the University of South Africa is conducting a research under supervision of Msezane Sikhulile B in the Department of ABET and Youth Development, in the College of Education. I am inviting you to participate in a study entitled "Perceptions of Teachers and Learners towards the Integration of Environmental Education in the Classrooms". This study is expected to collect important information that could contribute in providing clear understanding to other teachers, learners and also curriculum developers by providing vital information on issues encountered when delaminating the Environmental Education (EE) curriculum.

Nine participants are selected from your organization and you are invited because of your responsibility, expertise, experience and enthusiasm you have on the learning of EE. I obtained your contact details from your school principal and Natural Science teacher. The study will assess the practices and challenges encountered in the processes of EE curriculum delaminating and will suggest possible solutions for the problems investigated. Hence, I would like to get your views, understandings and opinions on the topic under investigation through semi-structured interview. You will be benefited from the study in a way that your presence in the study can contribute to the scientific community.

The Focus group interviews will take approximately a maximum of one and half hours to take place at a mutually agreed upon date, place and time. Your participation in this study is voluntary. You may decide to withdraw from this study at any time without any negative consequences. All information you provide will be kept confidential. In order to secure its confidentiality your name will not be appear in the research report and publication. The result will be reported in aggregate form. However, in some cases, anonymous names might be used, with your permission. You have the right to insist that your name will not be recorded anywhere and that no one, apart from the researcher and identified members of the research team, will know about your involvement in this research OR Your name will not be recorded anywhere and no one will be able to connect you to the answers you give. Your answers will be given a code number or a pseudonym and you will be referred to in this way in the data, any publications, or other research reporting methods such as conference proceedings.

If you need further information which would facilitate your decision to participate in the interview, please, do not hesitate to contact me through +27 73 572 1539 or e-mail nkathy.shabalala@gmail.com. If you need further information on this research you can contact my supervisor- Lecturer Msezane Sikhulile B (Msezasb@unisa.ac.za) at University of South Africa (UNISA).

Thank you for taking time to read this information sheet and for participating in this study.

Thank you.

Yours sincerely

Shabalala Nonkanyiso Pamella
Researcher

Signature

FOCUS GROUP CONSENT AND CONFIDENTIALITY AGREEMENT

I_____ grant consent/assent that the information I share during the focus group may be used by Shabalala Nonkanyiso Pamella for research purposes. I am aware that the group discussions will be digitally recorded and grant consent/assent for these recordings, provided that my privacy will be protected. I undertake not to divulge any information that is shared in the group discussions to any person outside the group in order to maintain confidentiality.

_____
Participant's Name
(Please print):

_____
Participant Signature

Shabalala Nonkanyiso Pamella
Researcher's Name


_____
Researcher's Signature:

If you are and adult who gives permission you **consent** then delete assent.

CONSENT TO PARTICIPATE IN THIS STUDY

I, _____, confirm that the person asking my consent to take part in this research has told me about the nature, procedure, potential benefits and anticipated inconvenience of participation. I have read and explained to me and understood the study as explained in the information sheet. I have had sufficient opportunity to ask questions and am prepared to participate in the study.

I understand that my participation is voluntary and that I am free to withdraw at any time without any consequences. I am aware that the findings of this study will be processed into a research report, journal publications and/or conference proceedings, but that my participation will be kept confidential unless otherwise specified. In addition, I agree to the recording of the discussion and I have received a signed copy of the informed consent agreement.

_____
Participant's Name
(Please print):

_____
Participant Signature

Shabalala Nonkanyiso Pamella
Researcher's Name


_____
Researcher's Signature:

APPENDIX E

LETTER REQUESTING PARENTS/ GUARDIAN CONSENT: PARENTAL CONSENT FOR LEARNER'S PARTICIPATION IN A RESEARCH PROJECT

A LETTER REQUESTING PARENTAL CONSENT FOR MINORS TO PARTICIPATE IN A RESEARCH PROJECT

Dear Parent,

Your _____child is invited to participate in a study entitled "Perceptions of Teachers and Learners towards the Integration of Environmental Education in the classroom.

I am undertaking this study as part of my master's research at the University of South Africa. The purpose of the study is to investigate secondary school teachers and learners perceptions on the integration of EE in the classrooms in KwaZulu Natal. It is aimed at finding out how teachers in public schools interpret and make sense of the integration of EE within the new curriculum and how this impacts on the learners. Your school has been selected because it has the responsibility of ensuring that the learners are taught about their environment and the citizenry that is raised and groomed by the education system is able to mitigate environmental problems and is able to suggest way in which the environment can be saved.

The benefits of this study lies on the recommendations and contribution on improving the Environmental Education curriculum for the future generation and also recommending practical ways in which teachers can deliver the Environmental Education curricula to learners. I am asking permission to include your child in this study because he/she is one amongst other learners who are the suitable population to provide adequate information for the success of this study. I expect to have 23 other children participating in the study.

If you allow your child to participate, I shall request him/her to take part in a group interview. They will be grouped in eight and questions and different scenarios will be posed to them and they will have to answer those questions in a group, the study will take place during regular classroom activities with the prior approval of the school and your child's teacher. During these focus group interviews I will employ the use of audio and video recording and I urge you for your consent to use these tools while interviewing your child.

The study has no any kind of risks at all. There will be no incentives or reimbursement for participants in the research. There will be no reimbursement or any incentives for participation in the research. The feedback procedure of the research result will entail follow up telephonic calls and sending feedback using the school addresses or their personal address. Your child will receive no direct benefit from participating in the study; however, the possible benefits to education are the improvement of the teaching and learning practices of EE. Neither your child nor you will receive any type of payment for participating in this study

Any information that is obtained in connection with this study and can be identified with your child will remain confidential and will only be disclosed with your permission. His/her responses will not be linked to his/her name or your name or the school's name in any written or verbal report based on this study. Such a report will be used for research purposes only. Your child's participation in this study is voluntary. Your child may decline to participate or to withdraw from participation at any time. Withdrawal or refusal to participate will not affect him/her in any way. Similarly you can agree to allow your child to be in the study now and change your mind later without any penalty.

In addition to your permission, your child must agree to participate in the study and you and your child will also be asked to sign the assent form which accompanies this letter. If your child does not wish to participate in the study, he or she will not be included and there will be no penalty. The information gathered from the study and your child's participation in the study will be stored securely

on a password locked computer in my locked office for five years after the study. Thereafter, records will be erased.

The benefits of this study are to recommend ways in which the Environmental Education curriculum is improved for better sustenance of the environment for future generations. There are no potential risks in relation to participating in this study. There will be no reimbursement or any incentives for participation in the research.

If you have questions about this study please ask me or my study supervisor, Lecturer Msezane Sikhulile B, Department of Science and Technology, College of Education, University of South Africa. My contact number is +27 73 572 1539 and my e-mail is nkathy.shabalala@gmail.com. The e-mail of my supervisor is msezasb@unisa.ac.za. Permission for the study has already been given by the DoE district manager, Circuit Manager and the Principal and the Ethics Committee of the College of Education, UNISA.

You are making a decision about allowing your child to participate in this study. Your signature below indicates that you have read the information provided above and have decided to allow him or her to participate in the study. You may keep a copy of this letter.

Name of child:

Sincerely

_____ _____

Parent/guardian's name (print) **Parent/guardian's signature:**

Shabalala Nonkanyiso Pamella 

Researchers name (print) **Researcher's signature**

March 2019

Date

APPENDIX F
OBSERVATION SCHEDULE AT SCHOOLS

Observation Guide for Teachers and Learners

Date_____

Name of participant: _____

Gender: _____

Observation of the teaching and learning process

1. What are the objectives of the lesson?
2. What materials are used to help accomplish these objectives?
4. What teaching methods and practices are used to better teach EE? And are they effective enough?
5. How are unexpected events handled in the teaching and learning of EE?
6. What were the main features of this teaching lesson?
7. What seems to be the most interesting class activity in the lesson?
8. How does the learning atmosphere have the impact on the learning process?
9. Did the teacher show any subject knowledge to the lesson delivered?
10. What were the learner's reactions to the lesson?
11. Did the learners show any signs of misunderstanding while learning in class?
12. What were the factors that hindered the efficiently learning of EE in the classroom and how were they dealt with? If any.
13. Did the learners show any possibilities of changing their behaviour?
14. Are there any environmental Clubs around the school? And are they functional?
15. What is the behaviour of teachers and learners towards the environment and how do they interact with their environment in schools?

APPENDIX G
FACE-TO-FACE INTERVIEW GUIDE

Date _____

A. BACKGROUND INFORMATION

1. Organization _____
2. Gender: Male □ Female □
3. Qualification

3.1 1st Degree □ 3.2. 2nd degree □ 3.3 indicate, if any _____

4. Current occupation _____
5. Year of service:

5.1. As a trainer _____yrs

5.2. On current position _____yrs

5.3. Other assignment_____/____yrs

5.4. Total _____yrs

B. SEMI-STRUCTURED INTERVIEWS GUIDE

1. In your own understanding how would you describe the term Environmental Education (EE)?
2. What does EE mean to you as an individual and also as a teacher?
3. Share your experiences of teaching EE as a curriculum implementer.
4. In your opinion, what was the difficult experience you have had in delivering an EE lesson in class?
5. Is the curriculum of EE practical in classrooms and why?

6. EE has been described in some studies as a tool or system to teach individuals about their surroundings, do you think the purpose of EE is met by the teachers and learners? Substantiate your response.

7. Curriculum is developed by other officials named “Curriculum developers” who have no direct interactions with learners, what is your opinion of that, are the educational needs of learners taken into account or met coherently? Support your response.

8. Our world is facing massive and threatening environmental problems. What role can EE play in mitigating these environmental issues?

9. Do you think EE has been implemented efficiently and why?

10. From your own observation throughout your teaching years, has EE made any impact on how learners behave towards their environment?

11. In most schools, the school grounds are full of litter, there are no plants and the schools does not seem like a conducive environment for learners to learn. What do you think is the reason for this?

12. What do you think can be the intake of the Government and Department in ensuring that the school facilities/premises are conducive for learning?

13. As a teacher what challenges have you encountered in teaching EE? And what are the best ways in which we can overcome these challenges?

14. In your opinion, are your teaching practices in line with the purpose and aim of EE? Elaborate.

15. How can the teaching of EE be improved?

16. In your school do you have an environmental club/ committee? What is the duty of this committee/ club and do you think they have managed to reach out to these environmental issue?

17. Around the school community are there any environmental threats that you have noticed as an EE teacher and what have you done to solve them?

18. If you were a curriculum developer, what changes would you make in EE curriculum to improve it?

19. Suggest ways in which we can raise awareness of EE and also mitigate environmental problems around the world.

APPENDIX H
FOCUS GROUPS GUIDE

FOCUS GROUP INTERVIEW GUIDE for LEARNERS
Date _____

A. BACKGROUND INFORMATION

1. Organization _____
2. Gender: Male □ Female □

B. FOCUS GROUP INTERVIEWS GUIDE

1. What is the first thing that comes into your mind when you hear the word environment?
2. What does Environmental Education mean to you? Elaborate.
3. In thinking about the kinds of things that makes up the environment, how do you think these things can be sustained?
4. As a learners what are the things that you have noticed that destroys our environment? Then suggest ways in which they can be mitigated.
5. In your community there is a dumping site that is an unofficial dumping sit and the people living in your community next to this site are now starting to get sick. What do you think is the reason for this? And as a learner of this school, what initiation would you take to help out in the community?
6. Our world is facing threatening environmental concerns that places the future of the earth at stake. As a learner right now who will soon grow to be an adult, what actions would you take to ensure that the future of the planet is safe and what career would you follow that will help ensure that the planet is sustained?
7. EE topics are taught in different subjects. How have these teachings help in shaping your behaviour towards the environment?

8. Littering is one of the things that threatens our environment. How would you deal with other learners who keeps littering the school grounds? And what can you do to stop this behaviour?
9. What is the impact of EE in your life as individual, learner at a school, a society member and a family member?
10. What challenges have you encountered when learning EE?
11. Suggest ways in which the learning of EE in classrooms can be improved in schools?

APPENDIX I:
TRANSCRIPTS FOR FOCUS GROUP, FACE-TO-FACE INTERVIEWS AND OBSERVATIONS

FOCUS GROUP, FACE TO FACE INTERVIEW AND OBSERVATION TRANSCRIPTS WITH CODES

FOCUS GROUP QUESTION WITH RESPONSES FROM 3 DIFFERENT SCHOOLS:

1. What is the first thing that comes into your mind when you hear the word environment?

SCHOOL A

- "I think about to make our environment clean"
  (ISE)
- "I think about to keep our environment and communities clean"
  (ISE)
- "I think about to take care of our own environment"
  (ISE)
- "I think about all the living and non-living organisms"
  (PEP)
- "I think about Environmental cleanliness"
  (ISE)
- "I think about to not pollute the environment"
  (IEL)
- "I think about earth as a whole"
  (PEP)
- " I think about earth pollution"
  (PEP)

SCHOOL B

- "I think about water"
  (PEP)

- " I think about trees"

  (PEP)
- "I think about Soil"

  (PEP)
- "I think about Air"

  (PEP)
- "I think about animals and people that interact"

  (PEP)

SCHOOL C

- " I think about the place where we live"

  (PEP)
- " I think about nature"

  (PEP)
- " I think about the beauty of nature"

  (PEP)
- " I think about a place with many infrastructures"

  (PEP)
- " I think about an important aspect in people and animal lives"

  (IEL)
- " I think about Everything that surrounds us"

  (PEP)
- " I think about the interaction between people"

  (IEL)
- "I think about animals"

  (PEP)
- "I think about trees"

  (PEP)
- "I think about Flowers"

  (PEP)
- "I think about air"

  (PEP)

2. What does Environmental Education mean to you? Elaborate.

SCHOOL A

- "It teaches us how we should treat our environment so that it will not be contaminated by animals and inanimate objects"
  (IEL)
- "It encourages us about nature and plants"
  (PME)
- "It encourages us for our future to take care of the environment of our future"
  (ISB)
- "It teaches us that the lives of people should always be healthy and of the animals living outdoors"
  (**IEL)**
- "We learn about things that we should take care of which are living and non-living"
  (PEP)

SCHOOL B

- "It encourages us to respect our environment"
  (ISB)
- "It helps in life"
  (IEL)
- "It encourages us how to take care of the environment"
  (ISE)
- "It teaches us to love our environment as we love ourselves"
  (IRE)

SCHOOL C

- "It means knowing the importance of the environment"
  (IRE)

- “Knowing how to sustain our environment”
  (ISE)
- “It means to have adequate knowledge about the environment”
  (PEP)
- “To have adequate knowledge about the animals”
  (PEP)
- “To have adequate knowledge of the processes of the environment and what we get from the environment”
  (PEP)
- “It teaches us how to take care of the environment”
  (ISB)

3. In thinking about the kinds of things that makes up the environment, how do you think these things can be sustained?

SCHOOL A

- “Like plants, we can take care of them by watering them and take care of the earth by cleaning it”
  (ISB)
- “By not polluting water”
  (ISE)
- “By not polluting the earth and by making fire without making it big because it will destroy trees and will create air pollution”
  (ISE)
- “By ensuring garbage like bottles are not discarded anyhow but rather taken for recycling”
  (ISB)
- “To prevent deforestation”
  (ISE)

SCHOOL B

- "We can ensure we do not dispose waste any how to prevent air pollution and keep our places clean"
  (ISE)
- "We can sustain water by ensuring that when doing laundry at the rivers we do not pour back dirty water in the river"
  (ISE)
- "Not to throw plastic anywhere"
  (ISB)
- "Not to burn fumes every time in order to take care of our air"
  (ISB)
- "Recycle waste papers, bottles and cans"
  (ISB)

SCHOOL C

- "Not to waste our environment"
  (ISE)
- "To refrain from cutting trees and prevent deforestation"
  (IRE)
- "To save water and minimise the overusing of water as this will lead to water scarcity and even droughts"
  (IRE)
- "To refrain from killing animals and stop rhino poaching"
  (IRE)
- "To stop polluting rivers"
  (ISB)

4. As a learners what are the things that you have noticed that destroys our environment? Then suggest ways in which they can be mitigated.

SCHOOL A

- “Littering”
  (CES)
- “Burning forces of fuels”
  (CES)
- “We can mitigate them by recycling”
  (SCE)
- “Providing bins in other houses”
  (SCE)

SCHOOL B

- “Building of factories”
  (CES)
- “Poaching of rhino and elephant horns”
  (CES)
- “Cutting of trees as they give us oxygen”
  (CES)
- “We can mitigate these environmental problems by encouraging and raising awareness on not destroying our environment”
  (SCE)
- “Print pamplets and posters to give and supply to people to make them aware of how to take care of the environment”
  (SCE)
- “Supply and provide bins in which people can dispose waste and then trucks to take and send for recycling”
  (SCE)

SCHOOL C

- “Littering”
  (CES)

- “Air Pollution from excessive fumes from factories”
  (CES)
- “Recycling”
  (SCE)

5. **In your community there is a dumping site that is an unofficial dumping sit and the people living in your community next to this site are now starting to get sick. What do you think is the reason for this? And as a learner of this school, what initiation would you take to help out in the community?**

SCHOOL A

- “They get sick because they live in a dirty environment”
  (PEP)
- “Because they inhale the smell in the air”
  (PEP)
- “Because of the germs”
  (PEP)
- “I will go and provide bins around the houses so that people can dispose in them and Saturdays and Sundays to collect and throw the waste in an official place”
  (ISE)
- “I will speak to my parent to speak to the ward counsellor on my behalf to speak to the municipality to send people to collect waste”
  (ISE)
- “To teach people that if you bought grocery you should keep the plastics and reuse the, besides cans they need to go for recycling”
  (IRE)
- “Form a group as learners to go door to door to collect garbage for the houses and place in a rightful place in which the municipality can collect them”
  (ISB)

- “To go to the dumping site to collect plastics and sell them”
  (ISE)
- “Form a group as learners to go clean at the dumping site and then visit houses to collect their waste to ensure they do not throw them at the same time they use to and recycle”
  (ISB)

SCHOOL B

- “The reason for people getting sick is because of the dirt and the smell in the air”
  (PEP)
- “Air is polluted because of the smell”
  (PEP)
- “We would put fence around that area”
  (SCE)
- “Ensure every household has a bin and then asks the municipality to send trucks to come and collect them”
  (SCE)

SCHOOL C

- “I will request bins from the municipality and ask community members to dispose their waste and being collected once a month”
  (SCE)
- “Recycle every week”
  (ISE)
- “Collect papers and other waste materials for recycling”
  (ISB)
- “We can hide it under the ground”
  (ISE)
- “Keep it in a one place and burn it all”
  (PEP)

- "Hold meeting for environmental awareness to raise awareness in which people will be taught how to take care of their environment" **(ISB)**

6. **Our world is facing threatening environmental concerns that places the future of the earth at stake. As a learner right now who will soon grow to be an adult, what actions would you take to ensure that the future of the planet is safe and what career would you follow that will help ensure that the planet is sustained?**

SCHOOL A

- "I would consider working at the municipality as a truck driver to collect waste from the communities" **(IRE)**
- "I would be a Supervisor in the municipality to ensure and select people who will go and collect waste" **(IRE)**

SCHOOL B

- "To create awareness on how to take care of our environment" **(ISB)**
- "Police to stop rhino poaching" **(ISB)**
- "Doctor to help people affected by environmental threats" **(IRE)**
- "Teacher to teach learners about the environment" **(PPE)**

SCHOOL C

- "Doctor to help people to teach them on how to live their lives" **(PPE)**

- "Scientist to teach people about the consequences of their actions"
  (PPE)
- "Environmental practitioner to teach people about their environment and how to take care of it"
  (IRE)
- "Engineer to fix bridges as environmental built structures"
  (CES)
- "Ward counsellor to help people by building houses and put electricity and put pins for them in the community"
  (CES)
- "Teacher to teach them about the environment and how their actions affect the environment"
  (PPE)

7. EE topics are taught in different subjects. How have these teachings help in shaping your behaviour towards the environment?

SCHOOL A

- "Not to get germs and live well with animals and humans"
  (ISB)
- "To know where I should dispose and where not to dispose waste"
  (ISE)
- "Not to throw plastics because I can reuse them again"
  (IEL)
- "To teach me about cleanliness"
  (IEL & ISE)
- "Not live in an unhealthy and unclean environment"
  (ISE)
- "Not to pollute the place in which I live because other people can be affected by that dirt"
  (ISB & ISE)
- "It teaches me how to take care of nature"
  (ISE)

- “It teaches me how to live a better life”

  (ISB)

SCHOOL B

- “It helped us to know what to do and what not to do in our environment”

  (ISB)

- “ It teaches us on how to take care of our environment”

  (ISE)

- “It helps us to pass on the information we have received from school to other people who are not at school”

  (IEL & ISB)

SCHOOL C

- “To teach us never to throw waste any how”

  (ISB)

- “To teach us to stay in a clean environment”

  (ISE)

- “To show us the consequences of an unclean and unhealthy environment”

  (IEL & ISE)

- “To take care of plants”

  (ISE)

- “Not to destroy the environment”

  (ISB)

- “How to save water”

  (ISE)

- “Not to pollute water and also not to pollute water on unnecessary things”

  (ISE)

- “To take care of plants so that we will have oxygen”

  (ISB)

- “Not to pollute water through burning of fuels”

  (ISE)

8. Littering is one of the things that threatens our environment. How would you deal with other learners who keeps littering the school grounds? And what can you do to stop this behaviour?

SCHOOL A

- "Report to the principal that there are learners who litter the school and the principal will take a decision to suspend that learner to enforce behaviour change"
  (ISB)
- "Report to a teacher"
  (ISB)
- "Tell that learner to pick up their waste"
  (PEP)
- "Tell the principal to put that learner on a detention"
  (PEP & ISB)
- "Teach them how to take care of the environment"
  (PEP & ISE)
- "I will join their group and tell them that what they are doing is not right, they should not throw waste on the ground"
  (ISE)
- "I will not speak to that learner so that they stop what they are doing"
  (ISB)

SCHOOL B

- "Hold a meeting and explain that it is not good to litter and explain the consequences of their doings"
  (ISE)
- "Expel that learner"
  (PEP)

SCHOOL C

- " I will teach that learner to throw in the bins"
  (ISE)
- "Teach that learner about the consequences of their behaviour"
  (ISB)
- "Teach that learner about the consequences of littering"
  (ISB & ISE)
- "I will always follow that learner around to tract their behaviour"
  (ISE & ISB)

9. What is the impact of EE in your life as individual, learner at a school, a society member and a family member?

SCHOOL A

- "It teaches us not to pollute the environment of the communities in which we live in and protect them"
  (IEL)
- "To take care of the living and non-living organisms to live a better life"
  (IEL & ISB)

SCHOOL B

- "To be a good example in my family as I have been taught"
  (ISB)
- "To make a living out of caring for the environment"
  (IEL)
- "To know what wrong and what right"
  (IEL)
- "Knowing not to cut trees as they protect houses against the blowing wind" **(ISB & ISE)**

SCHOOL C

- "It helped to teach other family members how to take care of the environment"
  (**ISB & ISE)**

- “I have taught people not to pollute air”
  (ISE)
- “I have taught people about the importance of cleanliness”
  (**ISE)**
- “ To teach them to save water and not to pollute water”
  (ISB & ISE)
- “To teach them about the importance of trees”
  (ISE)
- “To teach them not to throw waste in the sea as this will kill animals that live in the sea”
  (ISB & ISE)

10. What challenges have you encountered when learning EE?

SCHOOL A

- “Lack of knowledge because while growing we were not aware where to dispose our waste everywhere”
  (CES)
- “Not being aware of our actions”
  (**CES)**
- “no direct contact with the things learnt about in EE”
  (CES)
- “We learn about things that we so not see”
  (CES)
- “We cannot touch and feel the things that we learn about and analyse textbooks in classrooms”
  (CES)

SCHOOL B

- “No having direct interaction with the things learnt about in the curriculum”
  (CES)

- “Silent”
- “Lack of resources”

  (CES)

SCHOOL C

- “There is No direct interactions with the things we learn about”

  (CES)
- “We do not get to see or touch the things we learn about”

  (CES)
- “Lack of knowledge concerning the processes and importance of the things we learn about of the EE”

  (CES & SCE)

11. Suggest ways in which the learning of EE in classrooms can be improved in schools?

SCHOOL A

- “Bring posters in class”

  (SCE & PIE)
- “Bring samples of the things we learn about”

  (PIE & PPE)
- “Clear description of what we learn about”

  (SCE)
- “Outdoor education and interaction with nature”

  (SCE, PIE & PPE)

SCHOOL B

- “To plead with the government to provide them with resources that are lacking”

  (PPE & PIE)
- “Go back to the roots of Outdoor education”

(SCE)

- "Bring teaching aids and samples in the classroom"
  (PIE & PPE)

SCHOOL C

- "To learn outside. Outdoor education"
  (PIE)
- "To teach us about the things that we see at that time"
  (PPE & PIE)
- "Adequate knowledge to be provided of the subject matter"
  (**PIE & PPE)**
- "Environmental experts to visit schools to teach us more about the environment"
  (SCE, PIE & PPE).

INDIVIDUAL INTERVIEW DATA ANALYSIS

INDIVIDUAL INTERVIEW QUESTIONS WITH RESPONSES FROM 3 DIFFERENT TEACHERS IN DIFFERENT SCHOOLS:

1. In your own understanding how would you describe the term Environmental Education (EE)?

TEACHER A: "I think it is one of those subjects that are very important because it teaches us about a lot of things, like; cleanliness and our future depends in it and the knowledge that we have because we cannot survive if we somehow destroy the environment, while we not aware, so I think it is very important."
(PET)
TEACHER B: "I think EE is something that teaches about the environment, environmental sustainability for future generations namely, our plants,

animals, it all has to do with that and all the processes of the environment, like reproduction"

(PME, PTE)

TEACHER C: "I would say EE is anything that will do with the environment, a topic or rather a subject on the environment. So it is anything that has to do with our surrounding"

(PME)

2. What does EE mean to you as an individual and also as a teacher?

TEACHER A: "Ei, this question sounds the same as the first one, to me the environment speaks about me as a person or an individual".

(PET)

TEACHER B: "It means taking care of the environment that we were given by God, as I said before as to look after and protect the environment in different ways as you can see how rhinos were killed, to take care of the environment in many ways and as an educator to pass on the information to learners so that they grow knowing that the environment is important to us and without it we are nothing because we live because of the environment and we get food from it".

(PET & PME)

TEACHER C: "It means nothing to me honestly, I have never thought of bringing it into the classroom, but what I try to do is every time I make examples in sciences, I make any example that learners know and what they have seen before and something they are familiar with. It is not something I make an effort to do in the classroom, but I do make examples for instance, if I am teaching them on a topic in Natural Sciences (NS), there is a topic of ecosystems, there you can take the learners out and show them that even though this is a patch of grass that you do not think more about but there is an ecosystem going on there, so they see it. Like in Physics as well, in demonstrating Volume and Pressure, I would say that when you

cook at home, when you close the pot what happens, something like that, but I do not take them out of the classroom I only refer them to it".
(PET & PME)

2. **Share your experiences of teaching EE as a curriculum implementer.**

TEACHER A: "It helps me as well because it teaches me as a teacher. I learn a lot from it to make me aware, for example, recycling. I think it is something that helps me, not me alone but the community as well, because it is something we need to practice, but it is impossible, so it gives me an opportunity to be aware, as I heard the learners talking about recycling of plastics, those are the things that we have been doing, so it is very important in class not dispose anyhow so it teaches me as well".
(IEL)
TEACHER B: "I have learnt a lot especially on a topic on types of plants, because you grow knowing that the plants, planted by our parents what they really are, while learning and passing information on learners. I have learnt a lot on how animals behave and also plant types that we have in our country and how they are made and structured, the difference in their structures as there are some with big and small leaves, their advantages and what they produce and also the diseases that affect these plants and animals in different seasons, what they are and how to cure them if they are there so that all living organisms can survive".
(IEL & PTE)

TEACHER C: "To be honest, I do not have any experiences maybe even if they were, I would only see now since I now know that, you know what?, that was an EE topic, I think as teachers we are not aware or workshopped about EE topics, so right now I cannot think of any experiences"
(PTE)

4. **EE has been described in some studies as a tool or system to teach individuals about their surroundings, do you think the purpose of EE is met by the teachers and learners? Substantiate your response.**

TEACHER A: "Yes! All those things depends entirely to the availability of resources that we have, just like here in our school, what usually challenge us is time management or time given in the curriculum, we cannot do all the things we need to do because we have 3 periods and then break, if we were to get enough time we will do practical activities, because the curriculum back then had all the EE aspects like we use to go to the gardens"
(PPE)

TEACHER B: "Yes! I always say that as long as they grow, learn and told about the environment even on social media, they grow with the knowledge in knowing how to take care of the environment. But I am not sure whether it is met. On teachers I would say yes, because I have seen teachers even Geography teachers that they have knowledge of the content, it learners that I am not sure about".
(PIE)

TEACHER C: "It difficult to say because we teach the topics, I do not know it is about the environment, but the term EE makes me to separate it, because if it was pointed out somewhere or if we were trained or workshopped somewhere that let make our learners be aware of their surroundings, it would have been better. So I would partially say it is met indirectly because we teach those topics and by teaching the topics, we teach them about their environment, so I think it is met but it can definitely be improved"
(CET & PIE)

5. **Is the curriculum of EE practical in classrooms and why?**

TEACHER A: "It not, I think there are ways in which we can make it practical though especially as a school, because a school can make their own rules.

We can form a committee with learners to be responsible for the environment in our premises, maybe to guide people not to dispose or throw any how".

(PEC)

TEACHER B: No! It is not enough because it covers the theory mostly, it only talks about what written in books, as for going outdoors it is not possible, it only happens once after 2-3 years that you most likely go out with learners.it very rare, I would say the curriculum of EE should involve that there should be educational tours, go to the fields to the things we learn about in class, I think it is because of planning, because if a teacher can organise it, I will be successful. I think it is the lack of planning and organisational skills and some things we get from the subject advisors, they took us to a museum in Durban, so I think in a lower level it is just impossible. Maybe school curriculum and also the system on the when planning yearly activities in schools it must be included. Because the curriculum coverage does not allow for all these things to happen because we always chase to finish the syllabus and do not get time to take learners out to learn".

(PEC & CET)

TEACHER C: No! It is not practical, learners firstly, loves going out and see those things, there is no outdoor education in our NS curriculum although, maybe not that it is not there but I think it depends on how each teacher plans it in their lesson plan, but for me I have never taken learners outdoor but I think it something that to be done, because learners enjoys seeing those things learning about, because you find that when you explain, some learner is looking at something else they are not even listening, but if they were to be taken outdoor, you would intrigue their interest now and definitely everyone will listen and understand that topic out there and see that, you know what, these fancy words like ecosystems are actually something we know"

(CET & PEC)

6. In your opinion, was the curriculum of EE implemented efficiently and why?

TEACHER A: No! There are too many gaps, even though it was integrated in all subjects, but I think it needs its own time and be a subject or learning area. Back then it was there, even though I did not study it since I was still young by then, but I saw books showing that there was environmental studies, now it was integrated in the other subjects and not a subject on its own".
(PEC & PIE)

TEACHER B: "For now I would say yes, as we were taken to a museum by subject advisors last year to instil the environmental values for future generations and I felt like I really need to come with my learners here"
(CET & PEC)

TEACHER C: No! it was not implemented well, as we said there are already some environmental aspects that we have lost because when we talk about the environment we cannot restrict it into a classroom, which is what is happening now and you can see that there are a lot of things that learners are missing out, not living the outdoor education, but there are other places where learners can actually visit and see the environment like going on field trips, the EE can be expanded in secondary schools and I do not know, but I think it lack of time, first of all everyone is pushing for covering the curriculum. Secondly, no one is enforcing it, there is no one who will ask you. When subject advisors visit they only want to see content, whether you have covered the curriculum. No one is going to ask you whether you have done this, it just not important to them, even to us as implementers, even them who have developed it. Maybe there is no pressure in primary schools because they do these things but when it comes to secondary schools it is not done. For example, my mother is working in a primary school and they took learners to some farm, to me; yes learners enjoyed it, but I would not take learners there as it more like a surrounding of a rural area because these chickens and cows every day, so I think they should rather have taken

then to places where there are things that they do not see everytime but that is there in their environment.
(PIE, PEC & CET)

7. **From your own observation throughout your teaching years, has EE made any impact on how learners behave towards their environment?**

TEACHER A: "There is, but this is not something you can do alone or as an individual, it is something that we all need to do, by the way things are happening I do not see much change".
(ISB & IEL)

TEACHER B: "Yes! But a little, like I have said, we need to go out to teach and learn and extend our knowledge and so that they see that this is what we were learning about in the classroom, sometimes you see when you ask questions about plants in African ways then you will get answers and they will tell you the process of those plants and I think if they have that plant at home it is something they preserve because they know it use".
(IEL)

TEACHER C: "I believe there is a person who behaves in a certain way because they do not know the impact of their behaviour because sometimes a person may behave in that way because they do not know the impact they have on their environment, for example, as one as pollution, people may be negligent, children would throw papers because they do not know, so if they have been taught, there should be change in behaviour, so I am not sure if there is because here in our school every time after breaks the caretakers have to walk all around the school and pick papers and who knows what else they do out there, but at least when they know what they should do, let say they are in a place where they need to go get water from the rivers, maybe because their health is important to them, they would tell the families that we need to boil this water so that we kill germs before we drink it. So I believe there should be change of behaviour. But what I see

here in school there is less change of behaviour. But I think out there where comes something important to them they would apply this knowledge and I do not think the school management considers EE because if they were, there would be bins readily available for children to dispose to and in toilets they do not even have tissues and soaps to wash hands, especially here at school like how do you expect learners to wash their hands without a soap? According to my understanding, I would link EE with health education, I believe it goes hand in hand, like do they expect learners to wash hands with only water go to the tuckshop, buy, eat and lick their fingers, I think even a school as a whole does not support the environment".

(ISB & IEL)

7. Our world is facing massive and threatening environmental problems. What role can EE play in mitigating these environmental issues?

TEACHER A: "There is a great role that EE can play, I do not know how. Because in industries we can extend and expand EE eve there in people who work there and not restrict or limit EE in a school environment. So that even workers know how to manage their waste, you find that while there were floods the amount of waste was excessive".

(IRE)

TEACHER B: "As I am in contact with learners and as a teacher we are able to pass on the information on learners, so learning about EE they can pass the information at home or in their communities. Even at home they talk then information moves from one person to another until it reaches the whole community. Just like the burning of fires, they will know that they need to discourage this behaviour even when seeing someone who smokes they will be able to ask them not to throw on the dry grass. We pass the information to learners the most. Even about saving water, we teach them how to save water at school so that they apply the knowledge at home".

(PIE & IRE)

TEACHER C: "I think that in earlier grades it should be emphasised at the beginning, I may end as that we are taught about this and that, because the

shortage of water we look at it far away but if in classes it would be emphasised learners will grow up knowing that we should aware of these things then they would try to help out in saving water, then in the instance of pollution, it must not end as if we are taught for the purpose of writing an examination but there should be activities happening to support those things in their communities and in schools, it should not only end in schools but also in the community so that they can see that this is really important for change but as long as learners only to write examinations to them it just theory not practical".

(IRE & PIE)

9. As a teacher what challenges have you encountered in teaching EE? And what are the best ways in which we can overcome these challenges?

TEACHER A: I am not sure, because I cannot recall any challenges as EE talks about the things they know, something around them, even if they do not see it physically"

(CET &SCE)

TEACHER B: "Other learners get bored on other environmental topics like, gases especially the ones they do not see. I overcome this by showing them pictures and effects that when they start getting an interest and be excited. In a school where I was teaching agriculture before, I used to have a garden and I would take them out of the classroom to show and explain the viruses that affect the cabbages and how they can cure them and the learners who are exposed to the gardens at home they would listen attentively to understand the reason and what they should do to cure them, but the ones with no gardens at home have no interest as they get bored and would not want to participate, then I try strategies to convince them".

(CET & SCE)

TEACHER C: "Lack of time, pressed to finish curriculum and end up not teaching EE at your best of ability and to the best of the learners. I do not know how I have overcome them, we are just swimming, we just do it, seriously. Lack of resources, like the topic of earth and beyond, it is a nice

topic and again obviously we cannot take learners to space but the use of videos would be very useful to show them what is actually happening in space, but there are a lot of things, we can show them pictures, like you can see when they have to do an experiment, like the solar system, one they just put a planet in the centre and the sun is one of the bodies that surrounds the planet and you would see that they really do not understand it. It also laziness, from, let me not say from us teachers, but from me and that I am restricted by time because there is so much that I can do because there are charts of solar systems, as there is one I recently found and took out and pasted it on the wall, but I know that there is no one who is after me, no one is going to ask me, because they also do not know how it supposed to be, so it sometimes laziness and time ".

(CET & SCE)

10. In your opinion, are your teaching practices in line with the purpose and aim of EE? Elaborate.

TEACHER A: "Some other subjects you teach them not being aware that you are teaching something else, especially in NS, but I would say learners do learn something".

(PTT)

TEACHER B: "Yes! Even though our curriculum is not direct, but it comes as a teacher that since we are dealing with this topic I diverse to the environment in the community to make them concentrate through making examples of what happens at home and bring them back to the content of the lesson. We use the problems they see and associate it with the content. Bringing the known to the unknown dealing with in that time".

(PTE & PTT)

TEACHER C: "No, they are not in line, what I do is to teach content and learners write examinations and pass to the next grade. But now I will be aware"

(PTT)

11. In most schools, the school grounds are full of litter, there are no plants and the schools does not seem like a conducive environment for learners to learn. What do you think is the reason for this and what do you think can be the intake of the Government and Department in ensuring that the school facilities/premises are conducive for learning?

TEACHER A: "I do not know the reason, because I personally think the government is trying especially when we think about the history of our country, I think that I cannot really say what the government can do because I believe it in progress".

(CES)

TEACHER B: "The reasons for this is because of the change in the educational system, it start at the top since there was a program in schools in which they requested schools to plants flowers in front of the classrooms, plants were taken care of and watered so that the schools looks beautiful, I have forgotten the term used for this programme, there would be competitions some years ago maybe 7-8 years ago we had that program, but it just vanished and everything went back to normal. After that I continued to make learners take turns to go to the gardens and so on, I do not know how it ended. I remember there was a clause that was released that stated that learners must not work in schools because they came to learn, the ever-changing educational system removed learn by doing in schools, I think the government need to revisit this clause and go back to the roots, to encourage learners to learn by doing, they only learn but do apply knowledge of the information acquired"

(CES & SCE)

TEACHER C: "Most of the schools, but you mostly find that it is the schools with the low socio-economic background that have these problems and where the school have high socio-economic status they do not have these issues, I then ask myself what causes this? What causes the difference because there is real. I think that maybe they have extra money to accommodate all these things to make sure there is no litter everywhere and the parents because they are also educated they are able to enforce

those values in their children, that you do not just litter, when you finish to go to the toilet make sure you wash your hands then the low socio-economic background. Personally, I see Government as something far from us, they have minimal impact of what is happening in our schools as much as what these schools have is provided by them, one of the things they can do, is to enforce those values on subject advisors, make it as a priority and again to us it has come to a point where we do what the subject advisors want because if you do not, you will mostly likely find yourself into trouble, so it those things that you prioritise, so it should be enforced to them and then surely it will cascade to us as well".

(CES & SCE)

12. In your school do you have an environmental club/ committee? What is the duty of this committee/ club and do you think they have managed to reach out to these environmental issue?

TEACHER A: "In our school when you come to school, the first period starts, but I think it is something that we can do as a school. Because there are some woman who plants in the school from a Community Work Programme (CWP). We had it before, I remember some teacher was responsible for this committee, they would go to plant at the gardens, but because of no time it stopped".

(PTE & SPE)

TEACHER B: "No! There is no environmental club except the programme of a China Lady who comes and plant gardens in our school to give vegetables when they are ready to needy families and learners, maybe in a principal's mind it has never crossed his mind to form this committee".

(SPE & PTE)

TEACHER C: "I remember there was and I was part of it, I would say yes on paper it was there, and this club was supposed to clean the graffiti on the walls and plant flowers by the office area. But nothing was done, but on paper, it was there. So that when the department officials visit they will see there is a committee and for me to put in my CV that I am a member of the

environmental committee. But nothing has been done ever since. I guess that because we are busy and one of things is that we do not make an environment a priority and no one has asked us about it and having too many classes to teach is one of the reasons we are always busy. So if there would be more teachers in the school, that would make us flexible and teaching our subjects at the best of our abilities".

(SPE)

13. Around the school community are there any environmental threats that you have noticed as an EE teacher and what have you done to solve them?

TEACHER A: "I have seen littering since there are shopping centres nearby, to me what I can do looking at the community I live and work in, it is very difficult because we are far behind from things, the low socio-economic background has a big influence on how we do things, I know this thing of caring for the environment can help use economically, through recycling, but as we are very far, as people can actually make a living out of it, just like people who live in towns does, around this community people buy things and just throw waste. The only thing they are trying is to recycle metals, so I can encourage people to do recycling. To prevent littering it can work for us or in our advantage. I will also encourage the community to plant trees".

(PTE, PPE, ISE & ISB)

TEACHER B: "Not really except the violence in the community"

(CES)

TEACHER C: "In our town, there is litter, dirt and dirty ponds especially since there is a carwash nearby and there is another dirty pond behind the shopping centre, there are also squatter camps, who knows what children can get in this pond and do there? Luckily I would like to believe that no one get their water from that pond and near the flat in which I live, there is a place where we dispose our waste and that waste is collected once a month, throughout the entire month we inhaul smell and in the squatter camps there are mobile toilets, I cannot even imagine how they look like

inside and even electricity cords laying around, there is a lot, not only here but in most areas and again it is those places with low socio-economic background. I have done nothing and honestly do not plan to do anything because I am busy. I am being honest, but if I can get a chance I would talk to learners and tell them what to do and what not to do, but as far as in the community I just feel overwhelmed because I feel like the problems are too big and there is nothing I can do about it, it needs bigger bodies. So there is a feeling of being helpless and that there is just nothing I can do as an individual and also it needs people who makes it a priority, so far for me it is not something I have thought deeply about. But I am sure even though I am just a teacher and I am just a person who feels like there is actually nothing I can do, but if you were to find someone who is passionate about the environment something can be done"

(CES, ISE & ISB)

14. Suggest ways in which we can raise awareness of EE and also mitigate environmental problems around the world.

TEACHER A: "Through education alone, I cannot think about something else but only through education, I would visit churches to teach elders and in schools, because in churches that where you can get the elderly people"

(PIE & IRE)

TEACHER B: "Ei, I do not know, because even in school meetings, when parents are called they do not come, seriously, it would be difficult getting through this type of community, they are just not people you can call to educate, unless if you could contact their ward counsellor and then ask her to cascade the information to them".

(SCE, PIE)

TEACHER C: "Okay let talk about the electricity cords laying on the grounds, I think that because Eskom has not rendered services to them properly, so again it goes back to the bigger bodies, so how do we encourage people who are above us and in power even the toilets, so now it means we should speak to our ward counsellors to put and provide the primary needs because these are primary needs to the people and ensure

they have all of them”

(CES, SCE, IEL).

15. **Curriculum is developed by other officials named “Curriculum developers” who have no direct interactions with learners, what is your opinion of that, are the educational needs of learners taken into account or met coherently? Support your response.**

TEACHER A: “I think maybe in future if a new curriculum is to be developed, they should develop curriculum suitable for each province. Because you sometimes find that the curriculum that we use here is designed in Cape Town and that even the books we use talks about the things we do not know here in KZN, so maybe if we can say that curriculum should be designed in way that will cater for every provinces and the needs of the learners in that province. Even books talks about something that shows you that whoever wrote this book is from another province, they do not know what is happening in KZN. The needs of learners are not met because of the reasons I have specified. It only caters for people in that province, let say we speaking about mines, we do not have mines here”.

(PEC)

TEACHER B: “Yes! I believe information is there in our books and we deliver them to learners, information is provided, then it is up to us to try by all means to make the information meaningful and be able to apply it in real life and then there are practicality gaps, because we do not to the practical part”.

(PEC & PIE)

TEACHER C: “That a difficult one, because at the end of the day, the curriculum deals with mostly academics, purely academics. So the needs of learners are not taken into account. But again when they have received knowledge, there has to be change in behaviour, so I am somehow in between, so partially I would say they have, but surely it can be improved.

(PEC, ISB & PIE)

16. How can the teaching of EE be improved and if you were a curriculum developer, what changes would you make in EE curriculum to improve it?

TEACHER A: “by them giving us enough time in the curriculum and be a learning area on its own. As there are some subjects that you find unnecessary just like Life Orientation (LO), so if they would replace LO with EE because LO is not even recognised in tertiary.

(PPE & PIE)

TEACHER B: “I would include and encourage the outdoor learning and creation of gardens, a lot of things must be provided and encourage educational trips so that learner’s ca go out. Ensure these are on paper because even if you want to take learner’s on educational tours, because this is not on paper, you will have to follow drastic measures until you are discouraged because you have to explain a lot of things, I think what makes the department not to support these trips, it because of the behaviour of the learners, how they conduct themselves, they know if they were to allow this learners will misbehave and do not do what they are supposed to be doing”. (**IEL, PIE)**

TEACHER C: “Firstly, I would reduce the amount of content, I feel like it a lot, so that why we do not have enough time to do everything. But something there must be adjusted, I do not know whether we should be given more time or something needs to be taken out. Secondly, more practical, with this I mean things that will involve learners being hands on whether they go out there, whatever it is, whether they go see places or something they do in the classroom even if we do not go outdoor, but the resources must be brought in the classroom, so since we are not curriculum developers, as teachers we need to make use of what we have and stop complaining, we need to make the time and sacrifices, we also need to be active in teaching learners and make sure they get all these aspects we talked about, improve by showing them charts, videos and improve by taking them places. The use of Information Communication Technology (ICT) can improve EE, because ICT is capable of bringing what we cannot bring in the classroom, for instance, when I do practicals I can show them a video without me

actually having the chemical but at the same time having to see it because of the use of ICT, so in EE, ICT can play a big role because it can bring out the things we spoke about like earth and beyond topics they can see through the videos as it will show them the pictures and it will be able to bring anything since he cannot go outdoor, so at least bring in ICT so that we can bring in anything that we cannot bring in the classroom”

(PIE, PEC & PTE)

OBSERVATIONS DATA ANALYSIS

OBSERVATIONS QUESTIONS WITH RESPONSES OF 3 DIFFERENT TEACHING LESSONS IN DIFFERENT SCHOOLS:

1. **What are the objectives of the lesson?**

School A: "The objectives of this lesson, was to know about matter and material and that everything that is around that is matter"

(POE)

School B: "To know plants and animal cells, differences and similarities. To know the functions of the parts found"

(POE)

School C: "To learn about the process of photosynthesis and respiration, to learn how glucose is made, it uses and know about the use of plants they see around them and also the gases they produce and need".

(POE)

2. **What materials are used to help accomplish these objectives?**

School A: "The teacher used normal teaching materials like, chalk, board and also textbooks.

(PIE & POE)

School B: "The materials used are the normal teaching tools such as, chalk, board and textbooks".

(PIE & POE)

School C: "Normal teaching materials, chalk, board and textbooks in the classroom".

(POE & PIE)

3. **What teaching methods and practices are used to better teach EE? And are they effective enough?**

School A: “The teacher is used to normal teaching methods and practices as learners learn from the textbooks, but the teacher tries by all means to engage learners in the lesson by asking them questions”.

(PTT)

School B: “I believe that for better teaching of EE, outdoor learning should be much practised as learners need to have direct contact with what they are learning, therefore, the learning of EE in classrooms is not effective”.

(PET)

School C: “Well the teacher was referring to the study guide and I do not think they were a better resource to teach EE and they were not effective enough, for example, the learners needed to see the process of photosynthesis, at least show them on a video”.

(PTD, PET & PTT)

4. **How are unexpected events handled in the teaching and learning of EE?**

School A: “No unexpected events took place in the classroom”.

(CHE)

School B: “There were no unexpected events that took place during the lesson”.

(CHE)

School C: “Well, No unexpected events took place”.

(CHE)

5. **What were the main features of this teaching lesson?**

School A: “To teach learners that actually in the environment something happens because of the other”.

(ISB & PTD)

School B: “The main features of this lesson was to teach learners about their environmental features, how they come to being and differences”.

(IEL & PTD)

School C: “To teach learners the importance of plants in our lives and the uses of glucose, how they help us to breathe, how glucose give us energy and so on”.

(PTD, IEL & ISE)

6. What seems to be the most interesting class activity in the lesson?

School A: “The activity where they needed to explain the different terms of the environment”.

(PPE)

School B: “Learners were given a worksheet so they could show their understanding of the lesson”.

(PTT)

School C: “Where learners had to complete an activity to explain the terms and also the difference between respiration and photosynthesis, the process and advantages and disadvantage learners were able to demonstrate or apply knowledge about what they learnt”.

(PPE)

7. How does the learning atmosphere have the impact on the learning process?

School A: “Well the classroom activity is not conducive for learning, even the infrastructure of the school if I were to comment on that is not in a good condition”. The learners were learning in the dark, I even ended up asking myself whether learners were able to see those textbooks and also the learning atmosphere was not that much allowing and flexible, because the teacher would ask questions and learners would just sit there and stare at the teacher with no response until the teacher tells them the answer and move along. I guess the lesson was not interesting enough as new information was given to them. So it had a negative impact on the learning process”.

(PTT, IEL & PET)

School B: “The classroom atmosphere is flexible enough to allow effective enough as learners were engaged in the learning process as learners were participating reluctantly, they were bold enough to go to the board and demonstrate their answers when asked questions”.

(PET, PTT & PEC)

School C: “Well I believe the learning atmosphere is enhanced by teaching resources availability in the classroom, well in this case, yes there were teaching aids in class, but for this topic at hand there was nothing, and I would say teachers need to provide adequate teaching aids for every lesson to make learning conducive for learners”.

(PEC, PTT & PET)

8. Did the teacher show any subject knowledge to the lesson delivered?

School A: Yes! The teacher had a lot of knowledge about the lesson delivered as he managed to share all the aspects of the lesson”.

(PPE & PTD)

School B: “Yes! The teacher was able to trigger prior knowledge that learners had. The teacher showed adequate knowledge as objectives of the lesson were met”.

(**PTD, PET & PTT)**

School C: “Yes, she did because she was able to link examples from the environment to the content of the lesson”.

(PTT)

9. What were the learner’s reactions to the lesson?

School A: “Well learners showed little interest on the lesson as learners always need something that challenges them to think out of the box and present solutions”

(ISB)

School B: “The learners participated collectively with the teacher as they showed great interest on the lesson being delivered”.

(PET)

School C: “Learners were engaged, not all, but most learners were participating and responding to the teacher questions. So their reactions were positive and really showed engagement”.

(PET)

10. Did the learners show any signs of misunderstanding while learning in class?

School A: Yes! A lot. I think the teacher was moving very fast because of time or because they were just on interested on the lesson, maybe next time the teacher needs to bring in examples of the things they are more familiar with and what they know".

(CET & PET)

School B: "I would not say they showed any signs as the lesson was flowing in class. They showed misunderstanding when they were given an activity to complete".

(PTD)

School C: "Not really, but I believe something can be done to improve their learning, because we know learners do not learn and process information in a similar way, so more teaching practices needs to be brought into the classroom or the classroom to be taken outdoor".

(PTD, PET & PIE)

11. What were the factors that hindered the efficiently learning of EE in the classroom and how were they dealt with? If any.

School A: "Lack of resources, especially the class must have charts, pictures, the lights must be on during learning and teaching time so that learners do not learn in a dark place and that their learning can be enhanced by the welcoming classroom atmosphere".

(CET)

School B: "I think the factors that hindered the effectively teaching and learning of EE in the classroom, is that there were no samples displayed in the classroom, therefore, they were not dealt with".

(CET & SCE)

School C: "Lack of teaching aids appropriate for this lesson, well the teachers used a strategy of using the examples in which learners know how to explain the content of the lesson".

(PTD, CET & SCE)

12. Did the learners show any possibilities of changing their behaviour?

School A: “I believe so, if the teaching and learning of EE in schools is enhanced, learners can change their behaviour towards the environment, so the problem behind learner’s negative behaviour towards the environment is because even the teachers have a negative attitude towards it”.

(ISB)

School B: “I find it difficult to say there is any possibility as the lesson did not touch anything about human behaviour towards the environment, the lesson concentrated on the organism that we find in the world and how they come to being, how they are distinguished from each other etc.”

(PTT)

School C: “No! Because as long as the school hires people to be responsible of cleaning the school grounds after breaks, how their actions would and actually learn to clean after themselves”.

(SPE)

13. Are there any environmental Clubs around the school? And are they functional?

School A: “No! There is no environmental clubs, but I have found out that there was one year ago, but it stopped being functional”.

(PIE)

School B: “There are no environmental clubs, but I believe they should have took care of the environment, keep it clean, and plant flowers and plants in the school”.

(PPE)

School C: “Yes and I would not say that they are functional because they have not fulfilled anything and they have no accomplishments”.

(CES)

14. What is the behaviour of teachers and learners towards the environment and how do they interact with their environment in schools?

School A: “Actually there is no interaction between teachers and learners with their environment as nothing shows that there is any interaction. The school grounds speaks a lot, their surroundings says a lot about the negative attitude, there is litter, no gardens, toilets are a mess and so on. I just think that the teachers really need training and workshop so that their attitude is transformed and they would their attitude is transformed and they would be able to pass that on the environment”.

(CES & SCE)

School B: “Well, I would not say much because the teachers and learners do not show any impact of learning and teaching about EE and judging from the school grounds, their interaction is not positive as the school grounds are really not taken care of, there is litter, absolutely no plants in school”.

(ISB & PTE)

School C: “Well, I would say no interaction as teachers and learners do not play any part in securing and caring for the environment except teaching environmental topics and learning about them. Even teachers in the school shows lack of EE, what it is about, it purpose and actually how to teach it”.

(PME & IEL)

APPENDIX J
EDITOR'S LETTER

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29 November 2019

To whom it may concern

This letter is to confirm that I, Keegan Bruce Schmidt, freelance copy-editor, have edited and proofread Dissertation ***"Perceptions of Teachers and Learners towards the Integration of Environmental Education in the Classroom" by Nonkanyiso Pamella Shabalala*** for grammar and spelling.

I have not changed any of the ideas presented in this dissertation, only the grammar and spelling has been altered for the purposes of clarity. This is to confirm that I have edited the document to a level I deem satisfactory.

Should you have any questions feel free to contact us

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