STRATEGIES OF IMPLEMENTING ENVIRONMENTAL EDUCATION IN PRIMARY SCHOOLS IN ILEMBE DISTRICT, KWAZULU-NATAL: TEACHERS' EXPERIENCES

by

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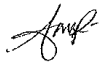
DECLARATION

I, MARK POISON GULE, declare that "Strategies of implementing environmental education in primary schools in iLembe District, KwaZulu-Natal: Teachers' experiences" is my own work and that all the sources that I have used or quoted have been appropriately and orderly indicated and acknowledged by means of complete references.



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I dedicate this study to all the members of my beloved family and the entire extended family, more especially to my late father, Pio; my mother, Evelyn; my wife, Jackline; my sons, Herbert and Enoch as well as my siblings.

ABSTRACT

The purpose of this study was to explore the strategies of implementing environmental education (EE) in primary schools in iLembe District in KwaZulu-Natal, a province in South Africa, and the teachers' experiences. The objectives were to describe the strategies used by primary school teachers to implement EE in iLembe District; to investigate how successful they were and the challenges they faced while using these strategies, as well as to explain how teachers can benefit from partnering with non-governmental environmental organisations in implementing EE in primary schools in this district. The study followed a phenomenological design using a qualitative approach, with interviews, non-participant observations and document analysis as the methods for data collection. The findings of this study revealed a number of classroom and outdoor strategies used by teachers in primary schools in iLembe District for implementing EE, which include designing posters, role plays, debates, group discussions, projects and showing videos and pictures, among others, as well as field trips, planting vegetables and trees, river and beach cleaning, litter picking, reusing waste materials and recycling. Teachers have experienced successes in terms of instilling environmental knowledge, skills and values in learners as well as natural resource conservation and having clean and green school environments. Challenges comprised inadequate time due to heavy workloads, lack of resources and funding, negative learner behaviour, poor communication and lack of support from stakeholders such as members of the school management team. Such challenges hindered teachers' success in the use of the aforementioned strategies, both in the classroom and outdoors. The study makes recommendations and offers directions for further research in the field to be carried out in primary schools that have never been affiliates of the Eco-Schools programme to discover the kinds of strategies used for teaching EE in such primary schools and the experiences of teachers in terms of successes and challenges in the course of implementing EE.

Key terms: Teaching strategies; environmental education; primary school; environmental challenges; teachers' experiences; implementation; environment; education; curriculum; teacher and learner.

OKUCASHUNIWE

Inhloso yalolu cwaningo bekuwukuhlola amasu okuqalisa imfundo yezemvelo (EE) ezikoleni zamabanga aphansi esiFundeni iLembe KwaZulu-Natal, isifundazwe saseNingizimu Afrika, kanye nolwazi lothisha. Izinhloso bekuwukuchaza amasu asetshenziswa ngothisha basezikoleni zamabanga aphansi ukuqalisa i-EE esiFundeni iLembe; ukuphenya ukuthi baphumelele kangakanani kanye nezinselelo ababhekane nazo ngesikhathi besebenzisa la masu, kanye nokuchaza ukuthi othisha bangazuza kanjani ngokubambisana nezinhlangano ezingekho ngaphansi kukahulumeni kwezemvelo ekusebenziseni i-EE ezikoleni zamabanga aphansi kulesi sifunda. Ucwaningo lulandele indlela yokuhlangabezana nezimo ezingachazwanga. lusebenzisa indlela egxile ekutholeni imininingwane ngokusebenzisa ukuxhumana okuvulelekayo, nezingxoxo, ukubhekwa okungahlanganyeli kanye nokuhlaziywa kwemibhalo njengezindlela zokuqoqa imininingwane. Okutholwe kulolu cwaningo kuveze inqwaba yamasu asekilasini nangaphandle asetshenziswa ngothisha basezikoleni zamabanga aphansi esifundeni iLembe asebenzisa i-EE, okuhlanganisa ukwenza amaphosta, imidlalo yokulingisa, izinkulumo-mpikiswano, izingxoxo zamaqembu, amaphrojekthi kanye nokubonisa amavidiyo nezithombe, phakathi kokunye, kanye nokuvakashela endaweni engaphandle kwekilasi elivamile, ukutshala imifino nezihlahla, ukuhlanza imifula namabhishi, ukucosha udoti, ukusebenzisa kabusha izinto ezilahlwayo kanye nokugaywa kabusha. Othisha bathole impumelelo mayelana nokugxilisa ulwazi lwezemvelo, amakhono namagugu kubafundi kanjalo nokongiwa kwemithombo yemvelo nokuba nezindawo zezikole ezihlanzekile neziluhlaza. Izinselele zazihlanganisa ukungabi nesikhathi esanele ngenxa yomsebenzi omningi, ukuntuleka kwezinsiza nokuxhaswa ngezimali, ukuziphatha okungekuhle kwabafundi, ukungaxhumani kahle kanye nokuntula ukusekelwa ababambiqhaza abafana namalungu ethimba labaphathi besikole. Izinselele ezinjalo zithiya impumelelo yothisha ekusebenziseni amasu ashiwo ngenhla, ekilasini nangaphandle. Lolu cwaningo lwenza iziphakamiso futhi lunikeza iziqondiso zolunye ucwaningo kulo mkhakha okufanele lwenziwe ezikoleni zamabanga aphansi ezingakaze zibe ngaphansi kohlelo olukhulu kunazo zonke lwezikole ezisimeme emhlabeni wonke ukuthola izinhlobo zamasu asetshenziswa ekufundiseni i-EE ezikoleni zamabanga aphansi kanye nolwazi lothisha. mayelana nempumelelo kanye nezinselelo ngesikhathi kuqaliswa i-EE.

Amagama asemqoka: amasu okufundisa; imfundo yezemvelo; isikole samabanga aphansi; izinselele zezemvelo; ulwazi lothisha; ukuqalisa; imvelo; imfundo;

okulindeleke ukufundiswa nalokho abafundi abazokwenza ohlelweni lokufunda, uthisha nomfundi

KAKARETŠO

Nepo ya thuto ye e be e le go hlahloba maano a go phethagatša thuto ya tikologo (EE) dikolong tša praemari Seleteng sa iLembe ka KwaZulu-Natal, profenseng ya Afrika Borwa, le maitemogelo a barutiši. Maikemišetšo e be e le go hlaloša maano ao a šomišwago ke barutiši ba dikolo tša praemari go phethagatša EE ka Seleteng sa iLembe; go nyakišiša gore ba atlegile bjang le ditlhohlo tšeo ba ilego ba kopana le tšona ge ba le gare ba šomiša maano a, gammogo le go hlaloša gore barutiši ba ka holega bjang ka go šomišana le mekgatlo ye e sego ya mmušo ya tikologo go phethagatša EE dikolong tša praemari seleteng se. Thuto e ile ya latela tlhamo ya mokgwa wa thuto wo o šomišago dipalopalo, ka dipoledišano, ditebeledišišo tša go hloka bakgathatema le tshekatsheko ya dingwalwa bjalo ka kgoboketšo ya datha. Diphihlelelo tša nyakišišo ye di utolotše palo ya maano a phapošiborutelo le ya ka ntle ao a šomišwago ke barutiši ba dikolo tša praemari seleteng sa iLembe go phethagatša EE, e akaretšago go hlama diphoustara, ditiragatšo, dipoledišano, dipoledišano tša dihlopha, diprotšeke le go bontšha dibitio le diswantšho, gare ga tše dingwe, gammogo le maeto a go ithuta selo la mathomo, go bjala merogo le mehlare, go hlwekiša dinoka le mabopo, go topa ditlakala, go šomiša leswa ditlakala le go šomiša leboelela. Barutiši ba itemogetše dikatlego mabapi le go tsenya tsebo ya tikologo, bokgoni le boleng baithuting gammogo le pabalelo ya methopo ya tlhago le go ba le ditikologo tša go hlweka gape tše tala dikolong. Ditlhohlo di be di akaretša nako ye e sa lekanego ka lebaka la boima bja mošomo, tlhokego ya didirišwa le thekgo ya ditšhelete, maitshwaro a mabe a baithuti, poledišano ye e fokolago le go hloka thekgo go tšwa go baamegi bjalo ka maloko a sehlopha sa balaodi ba sekolo. Ditlhohlo tše bjalo di ile tša šitiša katlego ya barutiši ka tšhomišo ya maano a a boletšwego ka godimo, ka phapošing ya borutelo le ka ntle. Nyakišišo e dira ditigelo le go fana ka ditaetšo tša dinyakišišo tše di tšwelago pele lekaleng leo le swanetšego go dirwa dikolong tša praemari tšeo di sego tša ba ditho tša lenaneo la *Eco-Schools* go utolla mehuta ya maano ao a šomišwago go ruta EE dikolong tše bjalo tša praemari le maitemogelo a baithuti mabapi le dikatlego le ditlhohlo nakong ya go phethagatšwa ga EE.

Mareo a bohlokwa: Maano a go ruta; thuto ya tikologo; sekolo sa praemari; ditlhohlo tša tikologo; maitemogelo a barutiši; phethagatšo; tikologo; thuto; lenanethuto; morutiši le moithuti

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LIST OF ACRONYMS AND ABBREVIATIONS

CAPS	Curriculum and Assessment Policy Statements
DEA	Department of Environmental Affairs
DFFE	Department of Forestry, Fisheries and the Environment
DHET	Department of Higher Education and Training
DoBE	Department of Basic Education
DPEP	District Primary Education Programme
EE	Environmental education
EEASA	Environmental Education Association of Southern Africa
EECI	Environmental Education Curriculum Initiative
EEPI	Environmental Education Policy Initiative
ESD	Education for Sustainable Development
GET	General Education and Training
IEEP	International Environmental Education Programme
NCS	National Curriculum Statement
NEEP-GET	National Environmental Education Project – General Education and Training
NEMA	National Environmental Management Act
NGO	Non-governmental organisation
RNCS	Revised National Curriculum Statement
SAEP	South African Education Project
SAGSP	South African Green Schools Programme
SANBI	South African National Biodiversity Institute
SANParks	South African National Parks

SEED	Student Empowerment for Environmental Development
SEEP	School Environmental Education Programme
UNCED	United Nations Conference on Environment and Development
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
Unisa	University of South Africa
WESSA	Wildlife and Environmental Society of South Africa

CHAPTER 1: ORIENTATION

1.1 INTRODUCTION AND BACKGROUND TO THE STUDY

Environmental issues are alarming in today's world, as the earth is increasingly being damaged on a daily basis by natural forces as well as manmade causes. Successful implementation of environmental education (EE) is therefore crucial in order to save the world from such problems that have persisted for many generations. In light of this, the world leaders, in conjunction with the United Nations, held international conferences and summits from as early as the 1970s to stage global environmental issues and concerns (Buthelezi 2015), the first conference being the Stockholm Conference held in 1972 (Makokotlela 2016). This was followed by the Tbilisi Conference of 1977, which was organised by the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the United Nations Environment Programme (UNEP) (Mawela 2020). After that, the Rio de Janeiro Earth Summit, commonly known as Agenda 21 or the United Nations Conference on Environment and Development (UNCED) of 1992, was held (UN 2020), followed by the Johannesburg World Summit on Sustainable Development in 2002. There was also an important workshop held in Belgrade in 1975, when the Belgrade Charter was adopted (Buthelezi 2015).

These conferences, summits and the Belgrade workshop provided the platforms for EE to be implemented in schools. The 12 guiding principles that resulted from the Tbilisi Conference, which include a) considering the environment in its totality – natural and built, technological and social; b) explicitly considering environmental aspects in the schemes for development and growth; and c) helping learners discover the symptoms and real causes of environmental problems, clearly emphasise the significance of integrating EE into school curricula and the strategies used to implement teaching and learning in EE, as well as the knowledge and skills learners require to solve environmental problems in real life (UNESCO 1977).

It implies, therefore, that for a successful integration of EE to be realised, suitable strategies are required for its implementation. The term 'strategies' refers to the intended activities used by primary school teachers to implement EE in schools, as outlined in the Curriculum and Assessment Policy Statements (CAPS) (DoBE 2011c). In other words, it refers to the activities aimed at achieving the objectives of teaching and learning in EE. Franca, Nunes and Paiva (2017) present significant strategies to be used to teach learners both on field trips and on the school premises. According to them, field trips, planting vegetable gardens and recycling projects are some of the examples of strategies that are suitable to be used by primary schools in conjunction with classroom activities to

teach EE. According to Favaro (2015), 'to implement' refers to making decisions and taking actions to turn a plan or an idea into reality. In other words, it means putting a plan or plans in action so as to achieve the desired goals, which in this case means using the strategies to teach EE in primary schools.

Unlike in South Africa's previous era**,** the attainment of democracy in South Africa in 1994 brought changes in the education system as environmental issues became part of human rights in the South African democratic Constitution (Matsekoleng 2017). According to the Constitution, a safe and clean environment for all citizens and preserving the environment for future generations, among others, have become part of fundamental human rights, as articulated in Section 24 in the South African Bill of Rights (RSA 1996). In light of this, there was therefore a need for championing environmental concerns through education. Consequently, the White Paper on Education and Training of 1995 upheld that EE, involving an interdisciplinary, integrated and active approach to learning, should be considered a crucial feature for all phases, from Foundation to Senior, the Further Education and Training band as well as programmes of the education and training platforms (DoBE 1995). This was done in order to mould environmentally lettered and active citizens through education, thereby ensuring that all South Africans, from generation to generation, live in a healthy environment. For this reason, integrating as well as implementing EE in the school curriculum across the phases became pivotal and therefore greatly influenced changes in the South African school curriculum.

Throughout the educational transformations as a result of the attainment of democracy in 1994, several changes have been evident in South African curricula, from Curriculum 2005 to the present National Curriculum Statement (NCS) Grade R–12, which encompasses the CAPS, to suit the new economic and socio-political era after 1994 (Matsekoleng 2017). One of the key changes is that the Department of Basic Education (DoBE) has crucially integrated EE into the South African school curriculum and has therefore emphasised its implementation in schools (Matsekoleng 2017). EE is therefore embedded in the NCS Grade R–12, hence CAPS, and it is stipulated in the general aims of the curriculum as environmental justice that is enforced by the national Constitution of South Africa (DoBE 2011a). South Africa has therefore become one of the countries that have considered the implementation of EE across the school curriculum as one of the key goals to be achieved by the education system (Mohammed 2016).

However, despite the socio-political efforts and the emphasis on enforcing the implementation of EE in the school curriculum, as indicated above, the strategies used by primary school teachers to implement EE in schools, to some extent, have not been successful. This suggests that much still needs to be done. If schools set a proper

foundation and use suitable strategies to implement EE as early as at primary school level, this would not be the case. Rahman, Halim, Ahmad and Mastura (2018) emphasise that for teachers to be successful in implementing EE in schools, they should have an understanding of the approaches or strategies that work best in a given context. However, their study indicated that teachers in Malaysia faced many challenges in implementing EE in schools due to the fact that the teachers lacked understanding of the concepts and content of EE (Rahman et al. 2018), which consequently inhibited them from using suitable strategies for teaching EE. This is one of the problems teachers face in South Africa, as confirmed by Mohammed (2016), indicating that teachers in some schools in South Africa are challenged by the implementation of EE due to a lack of proper understanding of the content as well as knowledge of appropriate strategies to use. Avci and Celiker (2015) are of the opinion that teachers should be able to mould a generation that adopts active learning as a useful strategy for teaching and learning EE. This, however, requires teachers who are well informed, dedicated, have positive attitudes towards the environment and are able to choose suitable strategies for teaching EE. It therefore means that there is a need to investigate the strategies used by teachers for implementing EE, especially at primary school level.

This study was therefore aimed at exploring the experiences of primary school teachers in iLembe District regarding the strategies they use to teach EE to prepare learners for the environmental challenges they may face in real life.

Contextually, the study was conducted in three primary schools that are situated in iLembe district in KwaZulu Natal, South Africa. The three schools are situated in different geographical locations, namely rural, farm and township. Socio-economically, the learners from the rural school come from a poorer background than the farm and the township learners. In terms of population, the rural school had a total of 1222 learners and 35 teachers while the farm school was the smallest of the three schools with a total of only 643 learners and 19 teachers, and the township school had 1547 learners with 44 teachers during the time of the study. The rural, farm and township schools were founded in 1987, 2000 and 1844 respectively.

1.2 SIGNIFICANCE OF THE STUDY

Today's world is experiencing several environmental problems at an escalating rate. Some of the problems arise as a result of natural forces, escalated by climate change (MacInnis & Krosnick 2020). Such natural disasters include tropical cyclones, hurricanes, draughts and many others. Examples of these are the tropical cyclone Idai, which hit Zimbabwe and some parts of Mozambique in 2019; the recent tropical cyclone Eloise, which affected mainly the parts of central Mozambique and South Africa's KwaZulu-Natal,

Mpumalanga and Limpopo provinces in January 2021; the recent droughts in South Africa; hurricane Laura and tropical storm Marco that hit the Texas-Louisiana border as well as California's wild fires in 2020 in the USA, among others (Baudoin, Vogel, Nortje & Naika 2017; MacInnis & Krosnick 2020; OCHA 2021; The World Bank 2019). These natural disasters have undoubtedly damaged the Earth and had devastating impacts on the respective economies. Apart from the natural disasters, the Earth is also increasingly being negatively impacted by reckless and neglectful human behaviours and activities such as littering and illegal dumping of rubbish, coupled with the impact of economic activities such as mining, which result in the Earth's degeneration (Makua & Odeku 2017; Mapotse & Mashiloane 2017; Matsekoleng 2017; Singh & Singh 2016).

Although efforts have been made to integrate and implement EE in schools, teachers have not yet succeeded in using suitable strategies to impart environmental knowledge and skills that would enable learners to address environmental problems. This study was conducted so as to shed light on how primary school teachers can use proper strategies to impart environmental knowledge and skills that enable learners to address environmental problems caused by climate change and human behaviour, among others. Such learners will then transform their communities through the environmental knowledge and skills acquired at school.

1.3 PROBLEM STATEMENT

The challenges facing teachers with regard to teaching EE in primary schools is not a new phenomenon in South Africa, but has been prevailing for some time despite the efforts that have been made to alleviate them. The studies conducted by Mapotse and Mashiloane (2017), Matsekoleng (2017) and Mboweni (2019) indicate that schools in South Africa have serious environmental problems posed by littering. The same problem has also been noticed in primary schools in iLembe District in KwaZulu-Natal. Such schools have their yards and playgrounds polluted with solid waste, which is very concerning. Littering is not only a problem in South African primary schools, but also in other parts of the world. For instance, primary schools even in developed countries such as New Zealand (Thomas 2018) and Italy (Rada, Bresciani, Girelli, Ragazzi, Schiavon & Torretta 2016) are facing problems with littering. This suggests there is a problem of teachers facing challenges in finding suitable strategies for successfully implementing EE in primary schools, consequently resulting in littered and degrading school environments in South Africa and across the globe. This prompted the investigation of the topic through this study in the primary schools in iLembe District to determine what strategies primary school teachers use as well as their experiences with regard to successes and challenges they encountered while teaching EE. It is a deep concern, as Mohammed (2016) confirms

that teachers lack the expertise in EE and therefore cannot find successful strategies to use.

It is crucial at this stage to explore the strategies teachers employ to teach EE in primary schools because it is integrated into the CAPS documents. The implementation of EE in primary schools has not only been a challenge for teachers in South Africa, but also across the globe. According to Van Dijk-Wesselius, Van den Berg, Maas and Hovinga (2020), the challenges teachers face with regard to teaching EE are partly related to their training background. Closely related to that, Gupta, Fraser, Shane-Simpson, Danoff-Burg and Ardalan (2019) also state that volunteers who were trained through formal volunteer programmes experienced pedagogical problems in the United States of America. This suggests that the volunteers only had peripheral exposure to the EE pedagogy through the volunteer programmes, and did not have proper training in terms of formal schooling that would have otherwise equipped them with the necessary knowledge and skills in order to use fitting strategies to teach EE. The same problem exists in the Netherlands, as indicated by Van Dijk-Wesselius et al. (2020) in their findings that many primary school teachers in the Netherlands face challenges while using strategies such as outdoor learning of tree planting, among other activities. This is due to the fact that such teachers have little or no expertise and no orientation or experience in outdoor teaching and they therefore lack the required confidence, as their didactical skills are inadequate due to their poor training backgrounds (Van Dijk-Wesselius et al. 2020).

Therefore, to minimise this gap, strategies that can successfully be used by primary school teachers to implement EE needed to be explored. This research sought to minimise the gap by investigating the strategies used by primary school teachers as well as their experiences related to the successes and challenges with regard to the strategies they use for teaching EE so as to contribute knowledge and skills, as guided by the research questions indicated below.

1.4 RESEARCH QUESTIONS

The main research question was formulated as follows: What strategies do primary school teachers use to teach EE in primary schools in iLembe District?

The sub-questions formulated were the following:

- What are teachers' experiences in terms of using strategies when teaching EE in primary schools in iLembe district?
- How do teachers benefit from partnering with environmental programmes to teach EE in primary schools in iLembe district?

1.5 AIM AND OBJECTIVES

The aim of the study was to explore how teachers use strategies to teach EE in primary schools in iLembe District, with the following objectives:

- To describe the strategies used by the primary school teachers to implement EE in primary schools in iLembe District
- To investigate how successful teachers are and the challenges they face while using strategies to implement EE in primary schools in iLembe District.
- To explain how beneficial it is to teachers to partner with environmental programmes and projects for implementing EE in primary schools in iLembe District.

1.6 RESEARCH METHODOLOGY AND DESIGN

This section covers the research methodology and the design for this study. The term 'research methodology' refers to the way of collecting and analysing data for investigating a particular research problem (McMillan & Schumacher 2010). Nieuwenhuis (2016) also describes a research methodology as the stratagem used by researchers for collecting, analysing and describing data to explain a phenomenon. In other words, the research methodology provides the guidelines for researchers to use as they go about collecting and analysing data. Research methodology encompasses the research methods, which in a simple way, refer to the tools employed by researchers for the collection of data (Nieuwenhuis 2016). These tools, in other words, are the instruments researchers use in line with a particular research design for gathering relevant information regarding their research topic.

A research design, according to McMillan and Schumacher (2010), describes procedures for conducting the study, including the time, participants and conditions for collecting data. In other words, it has the purpose of specifying the overall plan of the study. In this respect, phenomenology was used for this study as a design under the qualitative research approach. According to McMillan and Schumacher (2010), phenomenology describes the meaning for a number of individuals of their lived experiences of a phenomenon. Phenomenology has been chosen for this study because it falls under the guidance of the philosophical underpinning of interpretivism, which advocates for subjective interpretation of human beings and their perceptions of the world in which they live (Leedy & Ormrod 2010). The design was therefore suitable for this study, as it sought to investigate the experiences of primary school teachers with regard to the use of strategies for teaching EE.

Below follow the discussions of the research approach, population and sampling, instrumentation and data collection techniques as well as data analysis and interpretation as part of the research methodology and design.

1.6.1 Research approach

This study followed a qualitative approach as the research methodology. Qualitative research is an inquiry process that emphasises in-depth understanding of a phenomenon from participants' perspectives, which encourages the collection of data on naturally occurring phenomena, with the data written in words (Ivankova, Creswell & Plano Clark 2016). The qualitative approach was chosen for this study due to its capability of interpreting and describing phenomena (McMillan & Schumacher 2010). Under this approach, the phenomenological design, which focuses on the understanding of the essence of a reality (Jansen 2016), as followed in this study, is supported by experiential learning theory, which accentuates the significance of experiences in the learning process (Kolb 2015). This learning theory therefore made the qualitative approach and the phenomenological design suitable for this study, as it greatly assisted in data collection to discover the experiences of primary school teachers and their views on the strategies they use for teaching EE. Apart from aiding the data collection process, experiential learning theory is very much in support of teaching and learning strategies such as group discussions and projects (Kolb 2015) used by teachers to teach EE in schools, which therefore reinforced the significance of the relationship among the research approach, design and theory for this study. Issues of the research methodology will be discussed in detail in Chapter 3

1.6.2 Population and sampling

The term 'population' refers to the group of individuals or elements from which data are collected (McMillan & Schumacher 2010). It means an entire group of individuals, elements or objects to which the results of the study can be generalised (McMillan & Schumacher 2010). It is from the general population that a group of individuals or participants is selected or drawn to collect data from for the study. Since this was not a participatory research, the term 'respondents' was also used to refer to the participants who responded to the research questions. The population in the context of this study comprised primary school teachers from three schools out of whom the respondents for this study were selected. As per the sample size for qualitative research designs, Nieuwenhuis (2016) recommends an appropriate number of respondents for the phenomenological design to be at least six. This recommendation is supported by Maree and Pietersen (2016), who state that a smaller sample size is adequate to represent a homogeneous population, which for this study refers to primary school teachers.

Therefore, for this study, a total of six teachers were sampled as the respondents from three schools as further highlighted in subsection 3.3.3 of chapter 3. According McMillan and Schumacher (2010), the term ‘sampling’ describes the techniques and procedures for selecting participants or respondents. In other words, sampling refers to the process used by researchers to select participants from the general population for the purpose of collecting data. In this regard, purposive sampling was used as the technique for selecting participants for this study. Purposive sampling, as the name suggests, is when a researcher selects participants with a ‘purpose’ from the general population to represent a phenomenon, group, incident, location or type in relation to a key criterion (Maree & Pietersen 2016). Particularly for this study, homogeneous type of purposive sampling was used in the process of selecting respondents for this study due to its appropriateness (see Nieuwenhuis 2016). Purposive sampling was chosen for the reason that it allows the researcher to obtain the desired information about the topic of study from particular members within the population (McMillan & Schumacher 2010). With the purposive sampling technique, the researcher does not use probability in choosing the respondents, but his or her own judgement (Dudovskiy 2019). The researcher was convinced that the chosen respondents were well informed and would provide the required information about the topic under study (see Dudovskiy 2019). This technique was therefore deemed appropriate for this study, as specific teachers from the selected schools who were thought to be able to provide desired information for the study were chosen. In light of this, the three primary schools chosen were among the only five schools in iLembe District, KwanZulu-Natal, that were members of the Eco-Schools programme from as early as 2009 to 2017, with on-going Eco-Schools activities at the time of this study. Chapter 3 will provide more details on this.

1.6.3 Instrumentation and data collection techniques

Three data collection techniques were used to gather data for this study, namely interviews, non-participant observations and document analysis, which are discussed below.

1.6.3.1 Interviews

In-depth one-on-one interviews were used as the main instrument for gathering data for this study. These were conducted in compliance with the strict regulations regarding Covid-19, which consequently prompted virtual interviews with the participants. The questions for the interviews took the form of open-ended semi-structured questions, where the questions were phrased to allow for individual responses, but within a specific intention of the researcher (see McMillan & Schumacher 2010). The responses of the

respondents during the interviews were noted down and recorded using a journal and voice recorder respectively.

1.6.3.2 Non-participant observations

Non-participant observations, which entail no involvement of the researcher in the activities of the participants (Thompson 2016), were initially intended to be used as one of the data collection techniques. However, due to covid-19 restrictions, this changed to site visits as the researcher could no longer observe teaching and learning activities involving learners, and only the school premises were observed. Site visits were conducted to establish whether teachers used strategies such as planting trees and flowers, growing vegetables in the school gardens and recycling, among others, to teach learners. The observations were conducted in accordance with Covid-19 protocols in terms of the use of personal protective equipment such as a mask and gloves as well as sanitising and keeping a maximum physical distance from the respondents in compliance with the strict regulations put in place by the National Coronavirus Command Council. The researcher used a journal for taking notes and took pictures during the observations. This is due to the fact that, as stated by Nieuwenhuis (2016), in-depth interviews go hand in hand with observations. Therefore, by observing the school premises rich understanding of the phenomenon under study was obtained (see McMillan & Schumacher 2010). In other words, observing the environmental activities that took place on the school premises was vital for this study, as it enriched the data collected from the interviews and the document analysis.

1.6.3.3 Document analysis

Document analysis, also known as artefact collection, is a non-interactive strategy of collecting data from documents for a particular study (McMillan & Schumacher 2010). The reason for considering this method as one of the data gathering techniques as well as the kinds of documents analysed for this study are discussed later in section 3.4.1.3 of chapter 3. The same Covid-19 protocols as explained above were also observed during the process of document analysis. The data gathered from all the sources were then analysed and interpreted for reporting purposes. More details on this are to be found in Chapter 3.

1.6.4 Data analysis and interpretation

The qualitative data gathered through document analysis, interviews and observations were analysed through an inductive process (McMillan & Schumacher 2010). Documents regarding environmental policies such as the CAPS, the Eco-Schools and SEEP portfolios among others in the schools' possession were analysed. Notes taken during the interviews as well as voice recordings were read and listened to several times

respectively in order to make sense of them. This was then compared with the data collected during the non-participant observations to find a relationship or link through the process of triangulation (see Maree 2016). McMillan and Schumacher (2010) state that the collected data should be carefully read through and organised in a way so as to transcribe them into segments, after which the data should be coded and placed into categories (McMillan & Schumacher 2010). This was done for this study in order to assign meaning to the data through the process of complete coding (see Nieuwenhuis 2016). All the data were initially coded and only later in the process of analysis the researcher became selective while summarising and searching for relationships and patterns. The data were then grouped into themes in order to make sense for the purpose of presenting the findings, as recommended by McMillan and Schumacher (2010). The data were then interpreted for the purpose of synthesis so as to find a logical order in which to describe the essence of the phenomenon being studied (see McMillan & Schumacher 2010). Interpretation in this case was done by developing patterns and associations as well as defining and giving in-depth explanations of concepts in the data in order to make comprehensive meaning (see Nieuwenhuis 2016).

According to Nieuwenhuis (2016), the analysed and interpreted data should be able to move the researcher to a point of understanding in order to draw concrete conclusions from the findings, which was the case in this study. This is due to the fact that the credibility and trustworthiness of the data rely heavily on the data analysis, interpretation and conclusions based on the findings. Chapter 3 will provide further details

Trustworthiness in this study is discussed below.

1.7 TRUSTWORTHINESS

The term ‘reliability’ describes the possibility of using the same measures by different researchers to generate the same results (Maree 2016). ‘Validity’ in a qualitative study refers to the level of consistency between the explanations of the phenomena and the realities of the world (McMillan & Schumacher 2010). Trustworthiness in this study was addressed under the concepts of credibility, transferability, dependability and conformability**,** which are further discussed in details in chapter 3, section 3.4.3.

In addition, credibility and trustworthiness for this study were also ensured through triangulation. Triangulation refers to using multiple data sources and data collection techniques at different times while gathering data for a particular study (McMillan & Schumacher 2010). According to Maree (2016), the collection of data from various methods or techniques reduces bias. In this regard, the three data collection techniques as previously discussed in section 1.6.3 were used for this study. Through the use of such

a variety of techniques, consolidation in data was obtained, which therefore ensured the credibility and trustworthiness of the study.

1.8 ETHICAL CONSIDERATIONS

Research ethics concerns what is right or wrong from a moral perspective. As this was an educational research project, the researcher had to be fully aware that he would be dealing with people and information. Therefore, all the ethical and legal responsibilities had to be met. With this in mind, the following ethical and legal considerations, among others, as stipulated by McMillan and Schumacher (2010), were taken:

- Full disclosure: The researcher was open and honest with the respondents about all the aspects of the research, including the purpose of the research.
- Voluntary participation: The respondents exercised their full rights and freedom to participate in the study. Their names were not disclosed, they were assured of the confidentiality of the data and they had the right to withdraw without penalty.
- Informed consent: The respondents willingly agreed to participate in the study with full knowledge of what was involved.
- Professional integrity: Full respect and good care were accorded to the respondents. All scholarly sources used were accurately acknowledged in order to protect the intellectual rights of the authors.
- Legal constraints: The activities of the study fully fell under the umbrella of the law of the national Constitution and the South African Schools Act.

1.9 DELIMITATIONS AND LIMITATIONS

1.9.1 Delimitations of the study

Delimitations of the study are those characteristics that limit the scope and define the boundaries of the study (Theofanidis & Fountouki 2018). In other words, they are the standards or demarcations set by the researcher to regulate or guide the study. A notable delimitation was the scope of the study. The study was aimed at focusing only on the strategies teachers use in primary schools for teaching EE in iLembe District, KwaZulu-Natal. This therefore provided the researcher with definite directives and prevented unnecessary coverage.

In terms of methodology, qualitative research was chosen as an approach instead of mixed-method research, which is very complex in nature and requires more time and resources, thereby creating difficulties for the researcher to conduct the study. In addition, the choice of respondents was also another worth-mentioning delimitation under methodology. Only two teachers from three primary schools that have been members of

the Eco-Schools programme in iLembe District were chosen to participate in the study. This allowed the researcher to focus on the few teachers from the few primary schools and gather the desired information. This furthermore reduced unnecessary costs and time wastage. Another important delimitation is that limited research questions as well as objectives were set for this study so as to ensure quality in obtaining data.

1.9.2 Limitations of the study

The term 'limitations' refers to the potential weaknesses in a study over which the researcher has no control (Theofanidis & Fountouki 2018). In other words, limitations are conditions that may influence or restrict a study and which the researcher cannot control. In this study, time constraints and cost were factors to be considered as limitations. Lack of enough time and funding compromised the possibility of choosing more schools and more participants, which would have given a better opportunity to gather data from a wider population. The situation with the Covid-19 pandemic at the time of the study was yet another worth-mentioning limitation. Detail explanation on this will be provided in Chapter 5.

1.10 DISSERTATION LAYOUT

This dissertation is structured as follows:
Chapter 1 provided the introduction and background of the study. Chapter 2 presents the theoretical framework of the study. Chapter 3 discusses the research methodology and Chapter 4 presents the analysis and results of the study. Chapter 5 provides the conclusion of the study as well as recommendations for further investigations.

1.11 SUMMARY

In this chapter, the researcher briefly introduced the study and discussed the background as well as the significance for investigating the research topic. The researcher also briefly explained the problem statement in relation to the topic that needed to be investigated as well as the research questions which this study aimed to answer in relation to the research problem. The aims and objectives that emerged from the research questions were also discussed. This chapter also shed light on the methodology of the research that provided the guidelines for the procedures used to select the study site, population and sampling as well as data collection and analysis. It also discussed the credibility and trustworthiness of this study as well as the ethical considerations that were vital to contemplate before commencing with the investigation. Finally, the chapter briefly outlined the layout of this dissertation. The next chapter presents a review of literature that relates to the topic of this study.

CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

This chapter covers a review of literature that is relevant to this study. A literature review, according to Winchester and Salji (2016), is an evidence-based, in-depth analysis of a subject. It is a critical evaluation of the current summary of knowledge on a subject (Winchester & Salji 2016). In this way, a literature review therefore serves an important function in a study, as it manifests the understanding of a researcher about a specific field of study. In other words, it offers the avenue to explicate a strand of reasoning within the field of the study so as to provide answers to the questions of the study. In this study, literature such as theses, dissertations, policies and articles that provide relevant information on the background of EE at international, regional and national levels was reviewed. This was done for the reason that understanding of how EE is implemented using various strategies in other nations at international and regional levels was crucial to determine how strategies are used to teach EE in the contexts of the respective levels as well as in the local context, South Africa.

The challenges posed by environmental problems have been evident for many generations, which consequently yielded concerns among world leaders; therefore, the implementation of EE in schools, including primary schools, became crucial. However, teachers have not yet succeeded due to a lack of proper strategies that would assist in solving environmental problems (Mohammed 2016). The challenges experienced in relation to using specific strategies in the course of the implementation of EE in primary schools at all levels have also been indicated under the respective sections.

The chapter was organised topically comprising sections on the aspects of intergovernmental concerns and aspirations regarding the implementation of EE in schools and strategies used by teachers for the implementation of EE in primary schools at the three aforementioned levels. The theoretical framework and the clarification of concepts for this study formed part of the literature review to give epistemological guidelines and elucidate the knowledge presented in this study.

2.2 THEORETICAL FRAMEWORK

The terms ‘theory’, ‘theoretical frameworks’ and ‘theory of method’ have been used interchangeably in the literature and many studies, which therefore at times brings confusion as people try to grasp their meanings (Collins & Stockton 2018). However, according to Schunk (2012), the term ‘theory’ can simply be defined as a scientifically justifiable set of principles offered to describe a phenomenon, while Collins and Stockton (2018) state that a theory is one huge idea that assembles several other ideas with a high degree of explanatory power. Nevertheless, Kivunja (2018) describes theoretical framework as a structure that embodies theories, which researchers incorporate to serve

as a basis for analysing and presenting data as well as for discussing their findings. This is precisely stated by one scholar as quoted:

> Theoretical framework is the structure that can hold or support a theory of a research study (Swanson & Chermack 2013, p. 122).

In other words, distinctively, a theoretical framework is a broad term that encompasses a theory of a study and provides a foundation for a researcher to use the theory. Theories therefore offer the platforms for researchers to interpret environmental observations and serve as bridges between research and education (Schunk 2012). Collins and Stockton (2018) reiterate this, stating that a theory in a research study is interpreted as a lens or a signpost and gives a direction for how the study will process new knowledge.

Researchers need the guidance of appropriate theories in choosing the methods for their studies to answer their research questions (Collins & Stockton 2018). Theories are therefore very crucial in research, as they prepare the grounds, provide the directions and lead the researcher to reach definitive destinations. According to Schunk (2012), without theories, research findings would just appear as nothing but a haphazard pile of information.

There are a number of learning theories such as behaviourism, cognitivism and constructivism among others (Fulbrook 2019). However, this study followed the experiential learning theory as it relates to the title of this study. 'Experiential learning theory', as the name suggests, describes the process of learning from experiences (Kendra 2020). The theory was founded and introduced by David Kolb, a psychologist, whose work was influenced by some prominent theorists such as John Dewey, Kurt Lewin and Jean Piaget (Kendra 2020). Kolb's experiential learning theory takes a holistic approach and accentuates how experiences, including cognition, environmental factors and emotions, influence the learning process (Kendra 2020). Kolb (2015) defines experiential learning theory as that which elucidates a specific form of learning where an individual learns from life experiences. Experiential learning theory is therefore a theory that explains the transformation of experience into authentic knowledge (Kolb 2015). According to Kolb (2015), experiential learning theory stresses the learning type in which the learner is in direct contact with the reality being learned, unlike the learner who hears or reads about the reality. Such type of learning is best suited to learning strategies such as projects, field trips and problem-based learning, among others (Kolb 2015), which therefore further explains the appropriation of this theory for this study, as the aforementioned learning strategies are suitable for teaching and learning EE. Kolb's (2015) experiential learning theory was founded on four main concepts or constructs, which are referred to as four learning modes and they include: concrete experience

(concerns feeling or experiencing), reflective observation (concerns watching and reflecting), abstract conceptualisation (concerns thinking) and active experimentation (concerns doing or implementing). According to Kolb (2015), learning is a result of resolving the conflicts among the four learning modes which work in a cycle as the process is recursive. Kolb (2015) further groups the four learning modes into a model of two levels or categories of dialectically related modes namely: grasping experience (concrete experience and abstract conceptualization) and transforming experience (reflective observation and active experimentation). This implies that during the level of grasping experience, information is gathered and thought through while at the level of transforming experience, the information is reflected on and acted upon in order to transform it into an authentic knowledge.

Experiential learning theory is therefore in full support of the teaching and learning strategies of EE as well as the instrumentation and data collection techniques of this study, as the approach of the study aimed at obtaining data from one-on-one in-depth interviews as well as observations of learning activities such as recycling and planting, as two of the three data collection techniques. This was where primary school teachers were able to freely express their views and opinions about the experiences they had with regard to the strategies of teaching EE in primary schools and the respective challenges related to such strategies.

2.3 DEFINITION OF CONCEPTS

Concept clarification is of significance for the reason that the readers need to have a contextual understanding of the concepts with regard to a particular study. This is because, according to Green (2019), one concept may contextually have a number of interpretations and therefore be ambiguously understood. This therefore underlines the importance of defining concepts used in a specific study to the readers. The significant concepts in this study include teaching strategies, implementation, environment, education, environmental education, primary school, curriculum, teacher and learner, which are defined and described below.

2.3.1 Teaching strategies

Teaching strategies are general guidelines with clear objectives and time frame, which inform the methods and the activities to execute specific plans of teaching and learning (Saputra & Mokhamad 2014). Finzi (2015) added that while deciding on what strategies to use, the teacher carefully considers the diversity of learners in terms of a number of factors, such as age, level of understanding, classroom setting, teaching and learning support materials used and the curriculum, among others. On the other hand, Borrego, Finelli, Prince, Nguyen, Tharayil, Shekhar and Waters (2018) describe the term ‘teaching

strategy' as the way in which a teacher explains the purpose, expectations and activities to be carried out in order to execute particular learning content. For this study, therefore, 'teaching strategies' mean the activities used by primary school teachers to implement EE in schools.

2.3.2 Implementation

The term implementation, according to Ehrens (2015), refers to the act of executing a plan or putting a plan into action. In other words, it simply means making something work. For this study, the word 'implementation' is used to indicate how primary school teachers effectively use strategies to teach EE.

2.3.3 Environment

Mohammed (2016) defines the term 'environment' as a multi-dimensional phenomenon comprising biophysical, socio-economic and political dimensions. This is supported by Matsekoleng (2017), who describes environment as encompassing both biophysical and human components, including social, economic and political components. For this study, the term 'environment' refers to both the natural and the human surroundings of home and school as well as how these surroundings are used, protected and sustained for future generations.

2.3.4 Education

The term 'education' is broad and therefore poses difficulties in defining it in one simple way. However, according to Mohammed (2016), the term 'education' comprises the process of a lifetime development through which an individual acquires knowledge, skills and values. For this study, the term 'education' refers to the process by which individuals attain cognitive development and character building through acquiring knowledge, skills and values from formal or non-formal settings, which they then use to identify and address environmental problems.

2.3.5 Environmental education

Mohammed (2016) states that EE is a broad concept that cannot simply be defined in one dimension, which is why, several definitions exist. Mohammed (2016), however, describes EE as education that moulds people to become environmentally literate by acquiring necessary knowledge, skills and values for addressing environmental problems. Meanwhile, the UN (2020) refers to EE as unending lifelong learning that accentuates the complexity of environmental challenges and calls for the use of various and innovative educational ways to teach and learn. Munasi (2019) considers the definition of EE to be the process by which values are recognised and concepts are clarified for the development of skilful individuals who are able to embrace the existence of

interdependence between humans and their biophysical environment. while O'Donoghue and van Rensburg (1995) categorically describes EE under three dimensions as follows: a) education *about* the environment, which basically entails understanding of the concepts and the issues of the environment; b) education *for* the environment, which encompasses the attainment of the knowledge, skills and values that are essentially required to protect and sustain the environment; and c) education *in* or *through* the environment, which in a simple way refers to using the environment for teaching and learning in EE**.** In other words, education *through* the environment entails using the environment itself as a teaching and learning support material to develop environmentally related skills for solving environmental problems. For this study, however, EE is referred to as the process by which individuals, especially primary school learners, acquire knowledge, skills and values in order to recognise and appreciate the symbiotic relationship between humans and their physical environment and therefore to protect and improve it.

2.3.6 Primary school

McGee (2018) defines 'primary school' as a foundation-setting stage in education where children between the ages of 5 and 11 years old learn different subjects and skills. In other words, it is the first stage of schooling in the formal education system. In South African context, primary school categorically comprises two phases, namely the Foundation Phase from grades R to 3 and the Intermediate Phase from grades 4 to 6, as indicated in the CAPS (DoBE 2019). As stated by the Education Review Office (ERO 2016), primary schools are fundamentally crucial and basic institutions that prepare learners for secondary education. For this study, the term 'primary school' refers to the stage in the formal education system between preschool and secondary school for children between the approximate age of 5 and 11 years who are taught various subjects to acquire knowledge, skills and values to prepare them for their further academic journey as well as creative and critical thinking to handle life challenges, including environmental issues.

2.3.7 Curriculum

There are numerous ways in which the term 'curriculum' has been defined by different scholars, of which just few are as follows: The Great Schools Partnership (GSP 2015) defines the term 'curriculum' as the lessons and academic content taught in a school or in a specific course or programme, including the knowledge, skills and values intended for learners to achieve. According to ERO (2016), the knowledge, skills and values that learners achieve through the curriculum contribute to building learners' characters and empowering them to deal with life challenges imposed on them by environmental crises such as a shortage of water, drought and flooding, and to solve problems such as pollution

by litter and deforestation. According to the DoBE (2011c), the term ‘curriculum’ entails the subjects to be taught at a specific level of schooling, the programme of teaching and learning and assessment programmes as well as promotion prerequisites. However, according to the Department of Higher Education and Training (DHET) (2017), the term ‘curriculum’ can best be defined depending on the conceptualisation as well as the philosophical inclination. Therefore, the DHET (2017) offers the following three working definitions:

- *The intended curriculum*: This is the documented curriculum for a qualification that gives details on the description based on the depth, breadth, difficulty and level of cognition required for such a qualification.
- *The enacted curriculum*: This is the delivered curriculum centred on teaching and learning, including leadership and management as well as extramural activities.
- *The assessed curriculum*: This is the examined curriculum comprising all sorts of assessments, including school-based and external examinations.

The development of a curriculum for each level of education is subject to the policies provided in the National Qualifications Framework (DHET 2017). For this study, however, the term ‘curriculum’ refers to the totality of the activities centred on teaching and learning in primary schools or any learning institution, which encompasses the content, plans and programmes of teaching and learning as well as assessment.

2.3.8 Teacher

The DoBE (2011c) defines the term ‘teacher’ as a school-based educator whose job description is general classroom teaching, as described in the Education Labour Relations Council’s Collective Agreement 1 of 2008. Teaching is a noble profession that calls for passion, commitment, patience and dedication as well as sacrificial character from a person who would wish to become one and makes a difference in the lives of those in need of education (DoBE 2020). Teachers play a vital role in influencing equality, access and quality in education, sustainability and global development (UNESCO 2019). For this study, a teacher is regarded as an educator with superior knowledge, skills and values who is able to effect holistic development of learners by influencing positive change in them to enable them to solve environmental problems in real life.

2.3.9 Learner

The DoBE (2010a) defines the term ‘learner’ as any individual receiving education or obliged to receive education in terms of the South African Schools Act. On the other hand, the South African Council for Educators (SACE 2020) refers to the term ‘learner’ as a pupil or a student at any early learning institution, such as school and college. For this

study, ‘learner’ refers to a school-going individual who receives knowledge, skills and values in order to develop holistically with well-built character to handle environmental problems such as pollution, drought and flooding in real life.

2.4 INTERNATIONAL AND REGIONAL SCOPE AND ASPIRATIONS FOR THE DEVELOPMENT AND IMPLEMENTATION OF ENVIRONMENTAL EDUCATION IN SCHOOLS

From the early 1970s, a number of conferences, summits and workshops were held by world leaders, championed by the United Nations, to stage concerns about global environmental problems and aspirations to recommend EE as an important tool for solving environmental problems and therefore its implementation in schools (Buthelezi 2015). The first conference was the Stockholm Conference held in 1972, which gave rise to the Stockholm declaration that prioritized environmental issues as a global concern (UN 1972). This was followed by the Tbilisi Conference of 1977, which was organised by UNESCO and UNEP (UNESCO 1977). After that, the Rio de Janeiro Earth Summit (Agenda 21), also known as the United Nations Conference on Environment and Development (UNCED) of 1992 was held (UN 1992). This was followed by the Johannesburg World Summit on Sustainable Development in 2002. There were also workshops such as the Belgrade workshop of 1975, during which the Belgrade Charter was adopted (Dorn 2020).

The Stockholm Declaration, the Belgrade Charter and the Tbilisi Declaration were initiated by UNESCO in conjunction with UNEP (UNESCO 1977). These organisations later established a programme called the International Environmental Education Programme (IEEP) (UNESCO 1995), which formulated the objectives, goals and guiding principles for the implementation of EE, as discussed below.

2.4.1 Objectives of the International Environmental Education Programme

According to UNESCO (1995), the following are the objectives embraced by the IEEP, which include measures to be observed across the globe in order to achieve the goals of EE:

- Facilitate the coordination, joint planning and preplanning of the activities essential to the programme in EE
- Promote the international exchange of ideas and information pertaining to EE through Eco-Schools, as it is an international programme
- Coordinate research to better understand the various phenomena involved in teaching and learning

- Establish and monitor new methods, materials and programmes for EE for everyone in the community, either in school or out of school
- Adequately train and retrain personnel to staff environmental programmes
- Provide advisory services to member states relating to EE.

2.4.2 The goals of environmental education

UNESCO and the UNEP set the following goals for EE (UNESCO 1977):

- To foster clear awareness of, and concern about, economic, social, political and ecological interdependence in urban and rural areas
- To provide every person with opportunities to acquire the knowledge, values, attitudes, commitment and skills needed to protect and improve the environment
- To create new patterns of behaviour of individuals, groups and society as a whole towards the environment.

2.4.3 The guiding principles resulting from the Tbilisi Conference

The objectives and goals above are enforced by the following five selected principles of the 12 guiding principles resulting from the Tbilisi Conference (UNESCO 1977). These were selected because they directly support the topic of this study.

- Be a continuous lifelong process, beginning at the preschool level and continuing through all formal and non-formal stages. In other words, EE is intended to have no limits. It is continuous learning and the knowledge, skills and values acquired by learners, whether through formal or informal channels, need to be used to solve environmental problems. Preschools and primary schools form the basis of formal education where such environmental knowledge, skills and values are provided to learners from young age to prepare them for the lifelong journey regarding EE.
- Be interdisciplinary in its approach, drawing on the specific content of each discipline in making a holistic and balanced perspective possible. This means that EE should be integrated into other subjects and that teachers should therefore find suitable strategies to teach it together with the content of other subjects. Strategies such as school gardening, recycling and field trips among others could be used in that regard.
- Examine major environmental issues from local, national, regional and international points of view so that learners receive insights into environmental conditions in other geographical areas. This means that teachers should be able to use proper strategies to expose learners to the global context in order to see

environmental issues as a bigger picture and as an international concern, rather than only local.

- Enable learners to have a role in planning their learning experiences and provide an opportunity for making decisions and accepting their consequences. In other words, teachers should be able to involve learners in the process of lesson planning as well as use strategies such as projects and group work that provide freedom to learners to freely express their opinions in the process of learning.
- Relate environmental sensitivity, knowledge, problem-solving skills and values clarification to every age, but with special emphasis on environmental sensitivity to the learners' own community in their early years. This means that teachers should be able to strategize their teaching approaches to build learners from a young age to the adult age. They should use appropriate strategies that provide knowledge, skills and values to younger learners to solve environmental problems at a local context or at a community level and gradually expose them to the national, regional and global contexts as they mature and develop in the process of education.

As discussed above, the guidelines in the form of the aims, objectives and principles are very explicit and emphatic in the call for EE to be obligatorily implemented in schools across the globe. In relation to the above guidelines set by UNESCO and UNEP UNESCO (1977), during the Tbilisi Conference of 1977, UNESCO shed light on understanding the complexity of environmental problems, emphasising environmental sensitivity, knowledge and problem-solving skills that need to be instilled in learners, among others (UNESCO 1977).

2.4.4 United Nations Decade of Education for Sustainable Development; the Global Education 2030 Agenda and Education for Sustainable Development

Environmental issues have always been a global concern despite the international attention and efforts put in place as early as 1972 as discussed in section 2.4 above. For this reason, the global community have been cautious and therefore the United Nations came up with the idea of 'a Decade of Education for Sustainable Development', which ran from 2005 to 2014 (UNESCO 2021), with the main aim of integrating the principles and practices of sustainable development into all aspects of education and learning. In other words it aimed at reinsuring that environmental sustainability was an integral part of teaching and learning activities at every learning institution. This main aim is strongly linked with the topic of this study.

After the elapsing of the ten years' period of the 'Decade of Education for Sustainable Development', the global agenda 2030 for Education for Sustainable Development (ESD) was started. ESD is an international framework that was initiated during the 2012 United

Nations conference on Sustainable Development in Brazil to guide humanity towards sustainable way of living (UNESCO 2017). It was launched in 2014 and adopted in 2015 with 17 goals to achieve. The main aim of these goals is to ensure sustainable life with peace and prosperity for humankind on earth, with quality education that fosters acquisition of foundational and socio-cognitive skills for all (UNESCO 2017; African Minds 2021), as quoted:

> The aim of the 17 Sustainable Development Goals is to secure a sustainable, peaceful, prosperous and equitable life on earth for everyone now and in the future (UNESCO 2017, p. 6).

Notably, each of the 17 goals of ESD has specific learning objectives in order to achieve such goals. For example goal number six, which concerns ensuring availability and sustainable management of water and sanitation for all (UNESCO 2017), has one of its learning objectives, which focuses on the importance of water to life as quoted:

> The learner understands water as a fundamental condition of life itself, the importance of water quality and quantity, and the causes, effects and consequences of water pollution and water scarcity (UNESCO 2017, p. 24).

The goals of ESD, especially goal number six and the learning objective enable teachers in schools to instil in learners the knowledge, skills and values of environmental sustainability.

2.4.5 The African Union Agenda 2063

The Agenda 2063 is a current active African initiative introduced in 2013 as a strategic platform that aims at ensuring inclusive and sustainable development for the continental Africa (African Union 2022). It was intended to operate under the umbrella of the African Union, for the period of 50 years, that is, from 2013 to 2063 to attain inclusive and sustainable economic growth and development in African countries (African Union 2022). Although Agenda 2063 has as many as 20 goals, this study is mainly linked with goal number 7, which focuses on ensuring environmentally sustainable and climate resilient countries and communities (African Union 2022). This goal is also linked with goal number six of ESD discussed above, both of which therefore emphasize educating learners to embrace environmental sustainability and become responsible global citizens.

However, irrespective of the efforts of international and regional leaders and the guidelines set for the implementation of EE in schools, as discussed above, the following review of selected literature indicates that there is still a long way to go in terms of achieving the goals of EE. This is because teachers in many primary schools at

international, regional as well as national levels are facing challenges in connection with the use of strategies for teaching EE.

The strategies, successes and challenges with regard to using different strategies for the implementation of EE in primary schools are discussed below.

2.5 STRATEGIES, SUCCESSES AND CHALLENGES OF IMPLEMENTING ENVIRONMENTAL EDUCATION IN PRIMARY SCHOOLS AT INTERNATIONAL LEVEL

2.5.1 Introduction

This section covers two selected countries at international level that have put tremendous efforts into implementing EE in primary schools, namely Australia and India. These countries were selected for the reason that they presented relevant information for this study. Studies conducted in these countries have revealed strategies that have been used by primary school teachers for teaching EE. The examples in Australia and India include classroom strategies such as group projects, engaging learners in action research as well as other outdoor activities such as field trips, recycling and gardening, which have been indicated as successful for teaching EE (Kalorth & Sreekumar 2015; Treagust, Amarant, Chandrasegaran & Won 2016). Studies have also revealed that most of the teachers in these countries use similar strategies to teach EE in primary schools, although in India the Upcycler's Lab board games had been initiated as a unique strategy for teaching EE (Aditi 2018). This strategy is unique in the sense that it concerns using board games that have been produced in a lab from waste materials. Furthermore, it has double benefits as it works as a teaching and learning strategy and at the same time reducing environmental pollution by solid wastes.

Below is a detailed discussion of how primary school teachers in the abovementioned countries have been successful in using the aforementioned strategies for teaching EE as well as the challenges associated with using such strategies.

2.5.2 Implementation of environmental education in Australian primary schools

Australia is one of the countries worldwide that has shown incredible efforts in the implementation of EE in primary schools by using both classroom and outdoor strategies. Examples of such strategies include projects, recycling, tree planting and field trips. Teachers have experienced both successes and challenges in the course of using such strategies, as discussed below.

2.5.2.1 Success in the strategies used in Australian primary schools for teaching environmental education

Almeida, Barnes and Moore (2018) indicate that there has been great improvement in the implementation of EE in primary schools as a result of a supportive policy derived in 2010 by the Australian national curriculum authority, which emphasised accommodating EE in all subjects. The policy is part of the strategic plans that provide soft grounds for teachers to successfully use several other strategies such as field trips and recycling for teaching EE, and thereby its implementation. Treagust et al. (2016), in their study conducted in Australian primary schools, also found out that giving learners a project on a local environmental issue, for instance pollution by litter, to complete is one of the best strategies to use. This has successfully reduced solid waste pollution around primary schools, thereby keeping the environment clean. In addition, involving learners in action research regarding tree planting and recycling, for instance, conducted within community settings is another important strategy that works in Australia (Treagust et al. 2016). In these authors' opinion, such strategy exposes learners to learn from the experiences of elders and some informed community members. Action research on recycling and tree planting has furthermore resulted in reducing pollution by solid waste and counteracting deforestation, thereby keeping school environments clean and green (Treagust et al. 2016). This is a great success as per the achievement of the goals of EE (UNESCO 1977), as the protection and improvement of the environment are paramount.

The study of Gough (2016) indicates field trips as one of the strategies for outdoor activities of EE. Gough's (2016) findings further makes an important distinction between environmental outdoor education and physical education, which clarifies that environmental outdoor education is not physical education. This in other words means that the activities teachers plan for field trips should not be intended for exercise and fun but aim at encouraging learners to learn about the environment. .According to Treagust et al. (2016), field trips has been successfully used in Australian primary schools as one of the significant strategies for teaching EE. This has provided learners with the opportunity of interacting with their physical environment and natural resources, thereby acquiring knowledge, skills and values to protect and improve their environment (Treagust et al. 2016), indicating another success in achieving the aforementioned goals of EE (UNESCO 1977).

Notwithstanding the successes in the use of various strategies as indicated above**,** there were also challenges associated with the use of such strategies that have been faced by Australian primary school teachers in the course of implementing EE as discussed below**.**

2.5.2.2 Challenges associated with using the strategies of implementing EE in Australian primary schools

Treagust et al. (2016), in their study in Australia, found out that it is challenging for primary school teachers to guide learners in regular school settings to develop their knowledge, skills and attitudes in order to become environmentally responsible humans. This is due to the fact that teachers struggle to find strategies that offer wider opportunities for learners to freely engage in solving environmental problems in primary schools (Treagust et al. 2016).

In addition, the attitudes of learners towards the environment are yet another factor that affects the implementation of EE in primary schools (Treagust et al. 2016). According to the findings of Treagust et al. (2016), girls show more dedication and commitment to environmental affairs than boys because girls have much more positive attitudes and show more respect towards the environment than boys. This in a sense means that boys tend to be less attentive to or less involved in environmental activities, which therefore poses huge challenges to teachers while using both classroom and outdoor strategies such as designing posters, presentations, school gardening and litter picking, consequently hampering the implementation of EE in primary schools.

However, in the findings of Treagust et al. (2016), the challenges regarding the use of strategies such as field trips and recycling have not been exhaustive. Their findings do not clearly indicate the particular challenges met by Australian primary schools with regard to using such mentioned strategies for teaching EE, which therefore suggests further investigations need to be conducted.

2.5.3 Implementation of environmental education in Indian primary schools

India is one of the outstanding countries that have shown great efforts in the implementation of EE in primary schools through the use of strategies such as Upcycler's Lab board games and a programme known as the District Primary Education Programme (DPEP). Teachers in primary schools in India have experienced both successes and challenges in the course of implementing EE through using the aforementioned strategies, as discussed below.

2.5.3.1 Success in the strategies used in Indian primary schools for teaching environmental education

Aditi (2018) indicated in her study an interesting strategy known as the Upcycler's Lab board games used for teaching EE in Indian primary schools. The upcycler's lab was like any other lab, which was used to produce the board games from household waste materials and the board games served as an EE strategy**.** These board games were founded by Amishi Parasrampuria and the games work as a game-based approach to

teaching EE with activities that educate learners about the environment, wildlife and waste management. According to Aditi (2018), the games have worked very well as a teaching and learning strategy for EE, as they have augmented the Indian syllabus of EE. In addition, this approach has successfully instilled in learners the knowledge, skills and values regarding the environment, wildlife and waste management. In the opinion of Aditi (2018), the learners have used such knowledge, skills and values in real life to protect the environment through a reduction in solid waste pollution and taking care of natural resources.

Apart from the findings of Aditi (2018) above, the findings of Kalorth and Sreekumar (2015) indicate yet another strategy introduced in 1994 by a district called Kerala in southeast India. According to Kalorth and Sreekumar (2015), the DPEP, which is a learner-centred approach that was introduced to bring awareness of EE from the classrooms to the public, makes learning more effective and renders quality education at primary school level. This programme basically concerns classroom strategies such as group work and demonstrations, allowing learners to indulge in group projects, seminars, social service projects and quizzes, which consequently equip learners with environmental knowledge, skills and values. This has greatly aided the implementation of EE in primary schools in India (Kalorth & Sreekumar 2015). According to Kalorth and Sreekumar (2015), the DPEP has instilled the spirit of teamwork in learners by engaging them in group projects as well as social service projects (Kalorth & Sreekumar 2015) aimed at protection and conservation of the environment.

Kalorth and Sreekumar (2015) further unveiled another fascinating programme used in India, which is mostly used in the intermediate phase in primary schools as well as in high schools for teaching EE. According to them, a programme called Student Empowerment for Environmental Development (SEED) is a nature-oriented strategy started in 2009 by a local newspaper company called Mathrubhumi. The project is aimed at making EE a part of the school curriculum (Kalorth & Sreekumar 2015). SEED encourages learners to engage in environmental safety awareness campaigns, which focused on natural resources conservation such as rivers, among others**,** and uses media for disseminating information (Kalorth & Sreekumar 2015). In addition, and perhaps more importantly, the programme also encourages learners to engage in outdoor activities of cleaning and greening, such as cleaning the school grounds as well as creating school gardens (Kalorth & Sreekumar 2015). The SEED programme of Mathrubhumi has successfully worked in spreading significant information about environmental issues, such as awareness about protection and conservation of natural resources, to the public (Kalorth & Sreekumar 2015). Furthermore, as SEED encourages learners to participate in outdoor

activities (Kalorth & Sreekumar 2015), its success was also realised in the clean and green environment of primary schools in India.

However, besides the success of the Indian primary school teachers in using the strategies as explored above, there are also challenges faced by teachers in association with the use of such strategies. These are discussed below.

2.5.3.2 Challenges associated with using the strategies of implementing environmental education in Indian primary schools

Aditi (2018) indicates in her findings that some rural schools in India are challenged by a lack of connectivity while trying to use technology as part of teaching and learning strategies in EE. This is due to poor technological development in the remote areas of India, resulting in poor network coverage for phoning, for instance while organising excursions, and using the internet for online teaching and learning support materials. Furthermore, the Upcycler's Lab board games only work in urban areas (Aditi 2018). This is because, according to Aditi (2018), the strategy is best suited to urban areas with a high income and consequently high volumes of waste disposal. It follows therefore that the rural schools are deprived of the opportunity to learn through this strategy, which poses a challenge of socio-economic inequality.

However, apart from the challenge related to socio-economic inequality with regard to the use of Upcycler's Lab board games mentioned above (Aditi 2018), the findings of Aditi (2018) did not indicate the challenges related to the abovementioned strategies of cleaning and greening regarding the SEED programme, which involves recycling and school gardening, used in Indian primary schools. It therefore paves a way for further investigation to be conducted in this regard so as to have a full understanding as per this section of the study.

In the discussions above, a number of strategies used by primary school teachers for implementing EE in primary schools at international level have been indicated. In addition, the extent to which primary school teachers have been successful in using both classroom and outdoor strategies for teaching EE has been disclosed, also considering the challenges many of them have faced regarding the use of aforementioned strategies.

It is important to now consider the regional context to look at how successful primary school teachers have been in the implementation of EE with regard to the use of strategies while considering the challenges attached to such strategies that they face in African countries.

2.6 STRATEGIES, SUCCESSES AND CHALLENGES OF IMPLEMENTING ENVIRONMENTAL EDUCATION IN PRIMARY SCHOOLS AT REGIONAL LEVEL

2.6.1 Introduction

In this section, two African countries at regional level that have put efforts into implementing EE in primary schools are discussed, namely Tanzania and Egypt. These countries have been selected among others for the reason that they provide relevant information to the benefit of this study. Studies conducted in these countries reveal that similar strategies have been used by primary school teachers in the respective countries for teaching EE (Faragallah 2016; Kimaro 2018). For instance, most of the primary school teachers in the selected countries use classroom strategies such as presentations, formation of environmental clubs, debates, group discussions, projects and lectures as well as outdoor activities such as field trips, recycling, planting trees and vegetables, and picking up litter for teaching EE (Faragallah 2016; Kimaro 2018), which result in the instillation of environmental knowledge, skills and values in learners; information sharing as well as building positive attitudes towards the environment, among others, as indicators of success. Below is a detailed discussion of how primary school teachers in the abovementioned countries have successfully used such strategies for teaching EE as well as the challenges teachers face in association with the use of such strategies.

2.6.2 Implementation of environmental education in Tanzanian primary schools

Tanzania is one of the African countries that have put remarkable efforts into the implementation of EE by encouraging teachers to use strategies such as recycling and tree planting under the Twende Pamoja project and the Kihembe environmental learning centre for teaching EE in primary schools. Teachers in primary schools in Tanzania have experienced both successes and challenges in the course of implementing EE through using the aforementioned strategies, as discussed below.

2.6.2.1 Success in the strategies used in Tanzanian primary schools for teaching environmental education

McCrohan (2017) discusses the establishment of a non-profit organisation called Twende Pamoja, whose purpose it is to promote the development of a global vision in the context of relationships between communities, schools and other learning institutions with regard to EE. This organisation has supported primary schools in Tanzania, enabling teachers to use strategies such as giving learners practical projects to complete on an environmental issue such as recycling to teach EE. According to McCrohan (2017), such projects promote environmental conservation and encourage teamwork among learners, and provide them with the autonomy to construct knowledge for themselves. McCrohan (2017) further discusses another organisation called Kesho Trust working in partnership with another NGO, Saving Africa's Nature. Through this partnership, an environmental learning centre called Kihembe was founded, which is located in the village of Mkange

adjacent to Saadani National Park (McCrohan 2017). According to McCrohan (2017), this learning centre has successfully facilitated learning programmes through practical strategies such as tree planting and recycling for local primary school learners, instilling in learners conservational skills and encouraging them to protect and improve the environment, thereby achieving the goals of EE previously mentioned in section 2.4.2 of this chapter.

Kimaro's (2018) study reveals considerably more strategies than that of McCrohan (2017). According to Kimaro (2018), active learning strategies such as group discussions, investigations, role plays, presentations and demonstrations have been used by teachers in Tanzanian primary schools for teaching EE. Kimaro (2018) asserts that such strategies have successfully helped in information dissemination as well as enabling learners to acquire analytical, cooperative, research and communication skills, which they use for solving environmental problems such as pollution and deforestation in real life. In other words, when learners participate in strategies such as role plays and presentations about environmental problems, it puts them in the position of owning solutions to such problems, which results in building dedication and commitment to finding solutions to environmental problems. The teacher-centred classroom strategies, such as lectures and question and answer sessions (Kimaro 2018), have furthermore provided learners with the knowledge, skills and values that they need to protect their environment. In other words, learners have become aware of environmental issues or problems such as litter and what they ought to do to tackle them. This is evident, for instance when learners voluntarily participate in picking litter without being told to do so.

However, Kimaro (2018) indicates that most of the teachers in Tanzanian primary schools predominantly use teacher-centred approaches. This includes lectures and question and answer methods for teaching EE mainly in classrooms; no any outdoor strategies such as cleaning and greening activities as well as field trips are indicated by the author, which in a sense contradicts the findings of McCrohan (2017) above. A possible further investigation in this case is necessary. Despite the fact that primary school teachers in Tanzania have been successful in using the strategies as unfolded above, they have also met challenges associated with the use of such strategies, as discussed below.

2.6.2.2 Challenges associated with using the strategies of implementing environmental education in Tanzanian primary schools

The findings of McCrohan (2017) indicate that EE in the Tanzanian primary schools is being neglected. This is due to the fact that as EE is integrated with other subjects such as sciences, languages and Mathematics, the strategies teachers use in classrooms render minimal coverage to EE content, as priority is given to such mentioned 'academic'

subjects. This is a challenge, as EE content is less attended to, thereby hampering its implementation. Similarly, Kimaro (2018) also states that many teachers in Tanzanian primary schools tend to neglect the content of EE as integrated into other dominant subjects such as Science and Social Studies, which renders EE content less important. This implies that the teachers focus more on teaching the content of the other subjects than on the content of EE, leaving the content of EE less-taught or completely untaught, which further hinders the implementation of EE.

Kimaro (2018) indicates that the integration of EE into other subjects has resulted in putting teachers under considerable pressure and has created confusion regarding the contents of subjects. Challenges of this kind, in the opinion of Kimaro (2018), are also related to inadequacy in environmental expertise among Tanzanian primary school teachers, resulting from poor training received at tertiary institutions. According to Kimaro (2018), primary school teachers are faced with these challenges on a daily basis while trying to implement EE. This consequently hinders the implementation of EE as such challenges prevent teachers from using proper strategies such as field trips, recycling and school gardening for teaching EE.

McCrohan (2017) further indicates that rural schools are challenged by inadequacy of teaching and learning resources as well as limited staffing. Consequently, EE activities have been relegated to school-based environmental clubs, which are also few and inadequately supervised due to understaffed primary schools (McCrohan 2017). Given the situation of inadequate resources and understaffing, it furthermore suggests that several classroom and outdoor strategies, such as presentations, designing posters, recycling and excursions, are not administered properly, thereby hampering the implementation of EE. This is related to the findings of Kimaro (2018), who has furthermore disclosed more challenges faced by Tanzanian primary school teachers. According to her, challenges such as inadequate teaching and learning support material, including a shortage of textbooks, affect teachers daily. This is further exacerbated by overcrowded classrooms coupled with heavy workloads and insufficient support in terms of funding rendered to teachers (Kimaro 2018). All these factors discourage teachers from using both classroom and outdoor strategies such as lectures, group discussions, recycling, field trips and school gardening, which consequently inhibits the implementation of EE.

2.6.3 Implementation of environmental education in Egyptian primary schools

Egypt has also put stupendous efforts into implement EE in primary schools. Primary school teachers in Egypt have been successful in using classroom strategies such as lectures and group discussions, in conjunction with the Green Corner project (Faragallah

2016), to implement EE. Teachers have experienced both successes and challenges in the course of implementing EE through using the abovementioned strategies, as discussed below.

2.6.3.1 Success in the strategies used in Egyptian primary schools for teaching environmental education

The findings of Faragallah (2016) indicate that teachers in Egyptian primary schools predominantly depend on textbooks for information to teach learners only in classrooms using teacher-centred strategies such as lectures, group discussions, and question and answer sessions. Through such strategies, teachers have been able to inculcate environmental knowledge, skills and values in learners, preparing them to combat environmental problems in real life. In addition, the group discussions indicated by Faragallah (2016) are an important strategy that empowers learners and builds in them the spirit of teamwork as well as the skills of cooperation and communication. Addressing environmental problems is not an individual effort, but requires a collective fight, a view well supported by point number 6 of the guiding principles of the Tbilisi Conference of 1977 (UNESCO 1977) as well as Agenda 21, which both emphasise global collaboration and partnership in the fight for addressing environmental problems (UN 1992). This therefore implies that such learners have learned to work together and commit themselves in order to join the global partnership to participate in addressing environmental problems, indicating success.

According to Faragallah (2016), no outdoor activities are carried out by teachers in Egyptian primary schools for teaching EE. However, his findings revealed the Green Corner project, which is run by an environmentally concerned society in conjunction with the Ministry of State for Environmental Affairs and the Egyptian Environmental Affair Agency, which engage with schools to help as a strategy to provide EE literacy to learners. Through this project, a number of libraries have been established across Egypt, which has resulted in tremendous environmental awareness among learners (Faragallah 2016). This is a remarkable success as far as the efforts of the implementation of EE are concerned, given the fact that not only the learners benefit from the libraries, but also the public, thereby widening environmental awareness.

A coin always has two sides. The above discussions have revealed ways through which many primary schools in Egypt have successfully used various strategies to implement EE. However, the teachers' efforts in implementing EE in Egyptian primary schools have met great challenges, which are discussed below.

2.6.3.2 Challenges associated with using the strategies of implementing environmental education in Egyptian primary schools

Faragallah (2016) indicates in his findings that Egyptian environmental policies failed to effectuate the country's action plans for protecting the environment and shaping human behaviour towards the environment. This consequently resulted in poor EE development in primary schools, thereby affecting teaching methodologies for EE. In addition, according to Faragallah (2016), EE in Egyptian primary schools is further challenged by inadequate expertise among teachers due to lack of proper training in the field of EE, rendering teachers unable to choose proper strategies for teaching EE.

The above factor is coupled with overcrowded classrooms, especially in the early primary section from grades 1 to 3, which is even worse in rural schools (Faragallah 2016). Faragallah (2016) further indicates that most primary schools in Egypt rely only on classroom strategies of teaching using textbooks with limited content of EE and that learners predominantly rely on memorising facts and concepts only for examination purposes. In the opinion of Faragallah (2016), the schools do not provide learners with the opportunity for engaging in practical outdoor activities that connect them with their physical environment, which hampers the implementation of EE.

Furthermore, according to Faragallah (2016), EE content is overshadowed by the content of other subjects such as Science and Geography in which it is integrated. As a result, the classroom strategies such as lectures and discussions that many teachers use do not cover EE content, as they consider them less important. This yet again challenges the implementation of EE in Egyptian primary schools.

The above discussions indicate the strategies primary school teachers have used for teaching EE, how successful they have been in using the strategies as well as the challenges associated with the use of such strategies at international and regional levels. The following section focuses on the national level to discuss how EE has been implemented in South African primary schools.

2.7 STRATEGIES, SUCCESSES AND CHALLENGES OF IMPLEMENTING ENVIRONMENTAL EDUCATION IN PRIMARY SCHOOLS AT NATIONAL LEVEL

2.7.1 Introduction

This section covers discussions of the integration of EE into the curriculum and its implementation in South African primary schools. It comprises an insight into the history of South African curriculum development, the government policies that have supported the integration of EE into the curriculum and its implementation, strategies primary school teachers use to teach EE, the projects that have played a part in aiding the implementation

of EE as well as the challenges associated with the use of the strategies for teaching EE in South African primary schools.

Knutsson (2020) indicates that EE in South Africa, prior to 1994, took a slow start from the early 1970s, and it was predominantly considered as conservational projects, meaning that it focused only on the conservation of natural resources in exclusion of the socio-political aspects of the environment. Such projects for implementing EE were basically championed by NGOs such as the Environmental Education Association of Southern Africa (EEASA) from 1982 (EEASA 2020) and the Wildlife and Environmental Society of South Africa (WESSA) from 1926 (WESSA 2020) and were therefore not included in the formal education curriculum. However, with the attainment of democracy in 1994, changes emerged, as a 'clean and safe environment for all' became part of the human rights enforced in the National Constitution of the Republic of South Africa, which resulted in considerable progress in the implementation of EE (Knutsson 2020). Therefore, with the aid of policies such as the Environmental Education Policy Initiative (EEPI) and the Environmental Education Curriculum Initiative (EECI), among others (Zwelibanzi 2016), EE had to be included in the formal education system and therefore **in** the national curriculum to be taught in schools. This then led to the first introduction of EE into the South African formal school curriculum, which occurred in 1997 (Schudel, Songqwaru, Tshiningayamwe, & Lotz-Sisitka 2021). While this was yet an introduction to the then curriculum 2005, according to Mawela (2020), the first actual integration of EE in South Africa was piloted in June 2001, which was done in order to give formal recognition to EE in the school curriculum.

South Africa currently uses the NCS Grade R–12 through the CAPS for subjects (DoBE 2011a). It was launched in 2012 as a single, easily understandable policy statement, an amended version of the NCS, which had previously replaced the Revised National Curriculum Statement (RNCS) and curriculum 2005 with the outcomes-based education approach (DoBE 2011a). EE has been integrated into the South African curriculum right from curriculum 2005 to the present NCS with CAPS, giving an indication of the provisions made in the Constitution (DoBE 2011a). As advocated by the White Paper on Education and Training (DoBE 1995), EE is to be taught alongside the other subjects using active outdoor strategies such as field trips, recycling and school gardening as well as classroom strategies such as presentations, role plays, debates and projects. Each subject has its own specific aims for developing learners; content areas with topics, concepts and skills for learners to achieve; teaching time allocations per topic; and guidelines on assessments, as clearly stipulated in the CAPS documents (DoBE 2011b).

The South African curriculum fully supports the implementation and development of EE in primary schools. It aims to ensure that children acquire and apply knowledge, skills and values in ways that are meaningful to their own lives, which include sustaining the environment. In this regard, the curriculum promotes knowledge in local contexts, while being sensitive to global imperatives (DoBE 2011b). This is evidenced by one of the general aims as well as one of the principles of the curriculum of the Republic of South Africa, which state:

> a) Use science and technology effectively and critically showing responsibility towards the environment and the health of others [general aim] and b) sensitivity to human rights, inclusivity, environmental and social justice: infusing the principles and practices of social and environmental justice and human rights as defined in the Constitution of the Republic of South Africa [principle] (DoBE 2011b, p. 4).

The aim and the principle above clearly indicate the commitment of the curriculum of South Africa to the implementation of EE in the country's primary schools.

Below follow sections in which the policies and classroom and outdoor strategies used by South African primary school teachers as well as the projects that have aided in the implementation of EE are discussed.

2.7.2 Policies that have supported the integration and implementation of environmental education in the South African school curriculum

There are policies that have greatly aided in the integration and implementation of EE into the primary school curriculum in South Africa. Examples of such policies are EEPI and EECI. These policies have worked hand in hand with environmental Acts such as the National Environmental Management Act No. 107 of 1998 (NEMA), the Environment Conservation Act No. 73 of 1989, the Water Services Act No. 108 of 1997 and the Marine Living Resources Act No. 18 of 1998, among others, as well as the White Paper on Education and Training and the Bill of Rights, which are discussed below.

EEPI is one of the policies that aided in the integration of EE into the national curriculum of Republic of South Africa (Zwelibanzi 2016). EEPI was started as an advocacy and advisory structure that sought to introduce a participatory approach to the policy-making process in the EE curriculum in South Africa between 1992 and 1996 and paved a way for it in the South African education system (Zwelibanzi 2016). It advocated for, among others, a) EE as a local, problem-solving curriculum action and b) integration of EE into other subjects (Zwelibanzi 2016). It follows therefore that this policy has made great effort for the integration of EE into the curriculum and created a platform for teachers to

successfully implement EE in schools right from primary level using different strategies. Munasi (2019) added that EEPI also complemented the White Paper on Education and Training to recommend that EE is integrated into the school curriculum and adopted an active learning approach for teaching and learning.

In a similar way, EECI is one of the national curriculum policies that advocated for the implementation of EE in South Africa. Munasi (2019) states that EECI emanated from EEPI after the latter changed its focus to curriculum development. According to Munasi (2019), this policy played a key role in the development of the RNCS from C2005, consequently ensuring the integration of EE as a cross-curricular discipline in the South African curriculum framework for the General Education and Training (GET) band in the country. This therefore offers the ground for teachers to teach EE in South African schools right from primary level using various strategies such as recycling, excursions and tree and flower planting, thereby ensuring the success of the implementation of EE.

A number of Acts have also played a significant role as part of the policies in the implementation of EE in South Africa. For instance, NEMA is one of many other Acts that have supported the integration of EE into South African school curriculum (Beech, Lovells & Veltman 2017). As stated by Beech et al. (2017), NEMA plays a significant role way beyond supporting the inclusion of EE in the Republic of South Africa school curriculum, as it also plays a role in the management of national environmental affairs by:

- Setting principles and making decisions on environmental matters of the country; and
- Setting up institutions that execute cooperative governance and procedures for coordinating environmental affairs exercised by organs of state.

Together with NEMA, several other Acts, such as the Environment Conservation Act No. 73 of 1989, the Water Services Act No. 108 of 1997, the Marine Living Resources Act No. 18 of 1998, the National Water Act No. 36 of 1998, the Biodiversity Act No. 10 of 2004, the National Energy Regulator Act No. 40 of 2004 and the National Environmental Management: Waste Management Act No. 59 of 2008 have acted to address South Africa's environmental problems (Makokotlela 2016). The Acts further assisted in setting standards and principles in which the country's education system has to operate in order to ensure the integration and the implementation of EE (Beech et al. 2017). It implies therefore that the Acts have set the platform for teachers to operate in and use suitable strategies to successfully teach EE in primary schools.

In the promotion of the integration and the implementation of EE into the South African curriculum, the Acts also work in collaboration with the White Paper on Education and Training, as discussed below.

The White Paper on Education and Training is a crucial policy that carries the authority in the enforcement of the integration of EE into the school curriculum of Republic of South Africa (DoBE 1995). It was formulated by the Consultative National Environmental Policy Process, which was funded by the International Development Research Centre and the Danish Cooperation for Environment and Development in conjunction with the Department of Environmental Affairs and Tourism (DoBE 1995). The White Paper on Education and Training strongly advocates for the inclusion of EE into the South African school curriculum with an active approach to teaching and learning as quoted here:

> Environmental education involving an interdisciplinary, integrated and active approach must be the vital element of all levels and programmes of the education and training system, in order to create environmentally literate and active citizens and ensure that all South Africans, presently and future, enjoy a descent quality of life through the sustainable use of resources (DoBE 1995, p. 19).

Closely related to the White Paper on Education and Training is the Bill of Rights on Education, which is a component of the Constitution of the Republic of South Africa that has enforced the integration and implementation of EE into the national school curriculum (RSA 1996). The Bill of Rights considers the environment as part of important human rights, thereby advocating for its protection and providing a soft ground for EE to be integrated into the school curriculum, as stated in the quote below RSA (1996, p. 9).

> The Bill of Rights on Environment states that everyone has the right:
>
> a) To an environment that is not harmful to their health or wellbeing; and
>
> b) To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that—
>
> (i) Prevent pollution and ecological degradation;
>
> (ii) Promote conservation; and
>
> (iii) Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

The White Paper on Education and Training and the provisions in the Bill of Rights have undoubtedly aided the integration and implementation of EE in South African schools. However, they have not worked in isolation. In terms of the integration and the implementation of EE in the South African school curriculum, the above policies, Acts and the Constitution set the platform and guidelines for teachers to use the strategies discussed below to ensure success in the implementation of EE in the South African education system.

2.7.3 Strategies teachers use to teach environmental education in South African primary schools

Based on the policies and Acts discussed above, several classroom and outdoor strategies such as group discussions, debates, presentations and designing posters as well as field trips, recycling and planting of trees, flowers and vegetables have been used by teachers in South African primary schools for implementing EE. Apart from that, several programmes and projects have emerged in support of the implementation of EE in South African schools. Such programmes and projects include, among others, the Eco-Schools programme spearheaded by WESSA, the National Environmental Education Project – General Education and Training (NEEP-GET) and the South African Green Schools Programme (SAGSP), which are covered in this study. In addition, a number of organisations, both governmental and non-governmental, have also been very instrumental in aiding the implementation of EE in South African primary schools. This is due to the fact that South Africa, like many other countries such as Australia, values the importance of environmental NGOs in schools (Mawela 2020). Such organisations have offered tremendous support in the form of environmental awareness and provision of resources as well as linking various environmental activities directly with the curriculum, hence ensuring success in the implementation of EE in schools (Mawela 2020). Three of such organisations are discussed in this section, namely EEASA, the South African National Biodiversity Institute (SANBI) and South African National Parks (SANParks). The strategies indicated above are further discussed below.

2.7.3.1 Classroom strategies used in South African primary schools for teaching environmental education

Mawela (2020) indicates that some primary schools in South Africa have formed environmental clubs with groups of learners and teachers who take charge of the environmental activities in the schools. Through such environmental clubs, environmental competitions have been initiated through which learners engage in various learner-centred activities such as debating, essay writing and presenting, designing posters as well as working on projects (Mawela 2020). Learners have acquired environmental awareness, language skills of writing and speaking as well as fine arts skills through designing posters. The posters in turn have informed the primary school communities and the public about environmental issues in order to take action in solving environmental problems, which therefore translates into success.

Sanders and Schoeman (2019) have indicated the use of technology as another classroom strategy of teaching EE. The findings of their study conducted in Gauteng province, South Africa indicate that about 40% of the educators are comfortable of

successfully using ICT, which involves using computers for internet, PowerPoint and showing videos to learners for teaching EE. Although 40% is a small percentage, it is an indication of success as such teachers are able to use modern technology as integral part of EE strategies and therefore enabling learners to learn with excitement. Meanwhile Ruthanam, Reddy and Pillay's (2021) findings indicate the use of magazines, newspapers and videos in classrooms as well as encouraging learners to watch EE programs on television at home to be another effective strategy for instilling environmental knowledge, skills and values into learners. This strategy, in other words exposes learners to environmental awareness and they therefore use the information to solve environmental problems in real life.

A study conducted by Sousa, Richter and Raath (2017) in some South African townships and urban primary schools of the Gauteng and North West provinces revealed that most of the schools conduct environmental lessons in classrooms using indoor strategies. The reason for this is suggested that most of the townships and urban primary schools are situated in locations that are not exposed to natural resources, compared to farm or rural primary schools that are located in the proximity of open land, vegetation, rivers, etc. The indoor strategies the teachers use include teacher-centred approaches such as lectures and question and answer sessions, among others (Sousa et al. 2017). However, in addition to such teacher-centred approaches, the teachers also encourage learner-centred approaches such as group discussions, designing of posters and projects especially in Life Skills classes (Sousa et al. 2017; Ruthanam et al. 2021). Through the aforementioned strategies, learners have gained environmental knowledge and skills to tackle environmental crises such as pollution and water shortage.

The classroom strategies discussed above denote the aforementioned education *about* the environment dimension of EE (O'Donoghue & van Rensburg 1995), which basically concerns the instillation of knowledge, skills and values in learners in classrooms. It does not, however, entail the dimensions of education *in* or *through* the environment, which are covered under outdoor strategies discussed below.

2.7.3.2 Outdoor strategies used in South African primary schools for teaching environmental education

Matsekoleng (2017) indicates hands-on practices such as litter-free campaigns of picking up and sorting out waste materials for recycling, greening the school environment as well as other outdoor activities such as field trips to be among the working strategies that South African primary schools are practising for implementing EE. The collection of litter for recycling and greening activities in such schools have resulted in the schools being cleaned up and greened, thereby providing a safe and conducive environment for

learning. Similar strategies of picking and sorting litter for recycling as well as greening the school environment surfaced in the findings of Mawela (2020). According to him, several primary schools, especially in the Gauteng township of Alexandra, engage in such hands-on activities of recycling in the schools to clean up the environment, as the area has a high rate of solid waste pollution. Furthermore, tree planting in conjunction with Arbor Day celebrations as well as establishing vegetable gardens have been practised by the primary schools in Alexandra township in Gauteng to green the environment (Mawela 2020). Mawela (2020) further indicates that primary schools in the same vicinity of Alexandra township engage their learners in water-wise activities such as checking and fixing leaking taps to instil in them water-saving skills. This is specifically one of the significant skills in terms of EE given the fact that South Africa is a water-scarce country (Donnenfeld, Crookes & Hedden 2018).

Teaching learners to pick up and sort litter for recycling, planting trees and vegetables as well as saving water have greatly encouraged a clean and green environment as well as conservation of water as one of the scarce natural resources in the context of South Africa. In support of that, Luiza, Barry and Schalk (2017) conducted a study on sustainable development in South African primary schools and their findings indicated that many primary schools use whole-school approaches to educate their learners and the entire school community about sustainability. According to them, practical activities of cleaning and greening such as sweeping, picking up litter as well as planting trees, flowers and vegetables in school gardens help considerably in promoting the implementation of EE. This approach works closely with the 3R campaign in making the idea of whole-school development a reality (Luiza et al. 2017). Reduce, Reuse and Recycle, commonly known as the 3R campaign, is an approach that deals with solid waste management, which therefore encourages schools to engage in practical activities to keep their environments clean. As a result, many primary schools have shown much improvement in keeping their environments green and free from solid waste pollution.

Similarly, the findings of Sousa et al. (2017) in their comparative study conducted on farm, township and urban primary schools revealed that schools in the urban areas of South Africa have engaged in the 3R campaign. This campaign basically encourages such schools to limit litter and recycle waste in the Technology class to create objects such as pencil cases, toy cars and many others. According to Sousa et al. (2017), the 3R campaign has successfully created unity among the stakeholders of schools and an atmosphere of working together in order to keep the school premises clean and green, thereby achieving the aforementioned goals of EE, denoting the success of the strategy. Their findings on farm schools revealed that farm schools have an advantage over urban

and township schools for the reason that they are situated in the resourceful vicinities of open land with substantial natural resources (Sousa et al. 2017). This encourages the education *in* or *through* the environment dimension, as such natural resources, for instance land, vegetation, animals and rivers, play significant role in teaching and learning EE, as learners are exposed to such natural resources through strategies such as field trips, tree planting and establishing vegetable gardens. The farm primary schools furthermore have another advantage over the urban and township schools due to a low rate of solid waste pollution compared to the urban and township schools, where there are high rates of consumption of plastic-wrapped food stuffs. This suggests that farm primary schools have more opportunities of exploiting natural resources for teaching and learning in EE than urban and township primary schools, coupled by successfully keeping their school premises clean and green.

The classroom and outdoor strategies primary school teachers use for teaching EE as indicated above have also been supplemented by a number of projects and programmes in the effort of implementing EE in primary schools. Two such projects and programmes covered in this study are discussed below.

2.7.4 Projects and programmes that support the implementation of environmental education in South African primary schools

2.7.4.1 Projects

NEEP-GET is an important project to mention. This is a project that was initiated in the year 2000 by the then Minister of Education, Kader Asmal, to play a part in enforcing the integration of EE into the then RNCS, especially in the GET band (Schudel, Songqwaru, Tshiningayamwe, & Lotz-Sisitka 2021; Zwelibanzi 2016). NEEP-GET was an initiative that aimed at providing professional development to curriculum advisors and teachers to promote the integration of EE into the curriculum and to implement it in schools (Schudel et al. 2021). The project has been tremendously instrumental in the implementation of EE in South Africa**.** Sanders (2018) indicates that this project had two phases, the first of which concerned research while the second one was aimed at professional development, through which teachers and other environmental practitioners were offered training. According to Zwelibanzi (2016), NEEP-GET has contributed to the current state of EE integration into the GET band while it also helped teachers to successfully implement EE through the use of various aforementioned classroom and outdoor strategies, which denotes success.

Another project worth mentioning is the South African Education Project (SAEP), which is an important local environmental project that originated from the townships of Cape

Town in the Western Cape and was founded in 1994 (SAEP 2021). SAEP endeavours to prepare learners and the youth at their various stages of development through education, life skills and psycho-social support (SAEP 2021). At primary school level, this project covers the Foundation Phase and part of the Intermediate Phase, that is, from Grade R to Grade 4 (SAEP 2021). The project helps by creating environmental awareness among learners and the youth of schools and surrounding communities, thereby contributing to the implementation of EE in schools and the public. This is a success that is obtained through SAEP as leaners and the youth of the local communities are being informed of the environmental issues and also get engaged in environmental activities such as recycling and vegetable gardening among others.

2.7.4.2 Programmes

The Eco-Schools programme is one of the international programmes to mention, which put efforts into aiding in the implementation of EE in primary schools across the globe. According to WESSA (2020), the Eco-Schools programme is the largest global programme of the Foundation for Environmental Education, which strives to support schools to achieve the goals of EE. The programme is active in 68 countries and 59 000 schools globally and has been operating in South Africa from 2003 under WESSA (WESSA 2020). Other member countries include Australia, Denmark, Germany Ghana, England, India, Malta and Uganda among several others (Eco-Schools 2021). Every school follows seven methodological steps for its functionality as a member school (Eco-Schools 2019). These steps are as follows:

Step 1: Establish an Eco-Schools Committee.

Step 2: Conduct an environmental review.

Step 3: Draw up an action plan.

Step 4: Conduct monitoring and evaluation.

Step 5: Link to the curriculum.

Step 6: Inform and involve the wider community.

Step 7: Practise the Eco Code.

The programme aims at raising awareness of environmental sustainability among schools and their surrounding communities, providing resources and assisting schools by linking EE activities such as recycling and school gardening with the curriculum (WESSA 2020). This is quite evident today in the five primary schools in iLembe District that have been

members of the programme. These member schools have undeniably benefited greatly from the programme in terms of the provision of resources such as seeds, seedlings, garden tools and water tanks as well as strategies such as litter picking at school, beach cleaning, checking water taps for leaks, making compost manure, tree planting and vegetable gardening, which encourage the holistic development of learners. Through the activities of Eco-Schools, the environments of the member schools are clean and green, which signifies success in EE.

SAGSP is yet another crucial programme operating mainly in the Limpopo province. According to the Department of Environmental Affairs (DEA) (2019), SAGSP was launched in 2017 by the Deputy Minister of Environmental Affairs in collaboration with the Limpopo Member of the Executive Council for Economic Development, Environment and Tourism and the Member of the Executive Council for Education. It is executed by the DEA; Limpopo Economic Development, Environment and Tourism; and the DoBE, and aims at educating learners about environmental issues such as sustainability and equipping them with the skills of solving environmental problems such as pollution and water crises (DEA 2019). SAGSP also challenges learners to participate in environmental projects, for instance on recycling and tree planting, campaigns and competitions with prizes, thereby greatly encouraging learners to actively and willingly participate in environmental activities, resulting in clean and green school environments. The SAGSP has therefore undoubtedly contributed to the implementation of EE in schools, especially in primary schools in the Limpopo province (DEA 2019).

Another significant programme is the Kids in Parks Programme which was initiated and managed through a partnership among SANParks, Pick ‘n Pay and the departments of Environmental Affairs and Tourism and DoE (SANparks). Kinds in Parks offers an opportunity for schools to visit a national park on a three days basis and the learners learn a lot about natural and cultural heritage (SANparks 2020). Through this programme, several schools visit national parks for field trips as well as academic camping. Learners receive lessons on the ecosystems and the sustainability of plant and animal lives, which have a direct link to the curriculum, for example with topics such as ‘Biodiversity’ and ‘Interdependence’ in Grade 5 Natural Sciences (SANParks 2020). As a result, the SANParks, through the educational programmes, has supported outdoor learning and learners have used the awareness they gain to protect and improve their school and home environments.

The organisations discussed below are among many that have worked hand in hand with the projects and programmes discussed above to ensure the implementation of EE in South African primary schools.

2.7.5 Organisations that have supported the implementation of environmental education in South African primary schools

EEASA is an important body that has contributed to the implementation of EE in South African schools. EEASA was founded as a multidisciplinary association with a focus on processes and quality of education with regard to EE, and it has operated regionally in the Southern African Development Community from as early as 1982 (EEASA 2020). The association aims at, among others, promoting EE as an interdisciplinary entity across the curricular; sharing of information concerning EE and sustainability and encouraging exchange of ideas and opinions about EE and sustainability within Southern Africa (EEASA 2020). EEASA has also incorporated ESD in order to tackle environmental issues (EESA 2020). In the course of realizing its aims, EEASA has been instrumental in supporting the development and implementation of EE in schools in southern Africa (EEASA 2020). In addition, through the association, primary schools in South Africa have been resourced and a number of teachers have acquired more environmental knowledge and skills through workshops and conferences, allowing them to use suitable strategies to teach EE (EEASA 2020).

SANBI is yet another national entity that also contributes tremendously to the implementation of EE in schools. According to the Department of Forestry, Fisheries and the Environment (DFFE) (2019), the institute was established in 2004 and it has played a leading role in South Africa's national commitment to biodiversity management, now and into the future. It has rendered a number of programmes to assist primary schools, such as offering lessons on wildlife to learners during field trips to the SANBI, establishing indigenous gardens for practical outdoor activities of planting trees and vegetables, and organising workshops for educators to develop their environmental competency (DFFE 2019). As a result, learners from primary schools in South Africa have gained environmental awareness, which they use to protect and improve their school and home environments (DFFE 2019). The indigenous gardens have encouraged greening of the school surroundings and conservation of indigenous tree species (DFFE 2019). Teachers have also acquired environmental literacy through workshops organised by SANBI (DFFE 2019), denoting success.

Although primary school teachers have been to some extent successful in the use of various strategies, studies have revealed quite a number of challenges that are faced by primary school teachers in South Africa in relation to the use of aforementioned strategies, as discussed below.

2.7.6 Challenges associated with the strategies for implementing environmental education in primary schools at national level

Even though South Africa has a sound curriculum with embedded environmental content, as indicated by the DoBE (2011b), the implementation of EE has remained a challenge for many teachers in primary schools, especially those with limited environmental expertise**.** At international and regional levels, most of the challenges are centred on similar issues such as inadequacy of teaching and learning support materials, time constraints, lack of funding, communication barriers as well as inadequacy of environmental expertise among teachers. These challenges consequently prevent teachers from using strategies such as excursions, recycling and school gardening as well as classroom strategies such as designing posters. All these activities require time and funding, and the lack thereof prevents teachers from engaging in such activities, thereby hampering the implementation of EE. More of these are discussed in detail below.

Mawela's (2020) findings showed that several teachers in Alexandra Township primary schools complain of a shortage of time due to heavy workloads and they perceive EE as an extra burden. This is coupled by overcrowded classrooms, which also exert pressure on teachers with regard to using strategies such as group discussions and school gardening as well as assessment practices (Mawela 2020). In addition, according to Ruthanam et al. 2021, teachers also do not consider EE as a vital or fundamental part of the subjects they teach. They rather see EE as an extra curriculum activity, therefore strategies such as lectures and discussions that they use favour the content of other subjects such as Natural Sciences and Mathematics, at the expense of EE content. This is echoed by Maluleke (2015), who indicate that many primary school teachers consider EE as an extra load that adds to their existing workload and therefore find it challenging to use strategies to implement it. As a result, teachers in such schools resort to neglecting the content of EE to concentrate on the content of the subjects which, according to them, are more important and on which assessments are conducted. This hampers the implementation of EE in South African primary schools. In the opinion of Mawela (2020), this misunderstanding is linked with insufficient environmental expertise among primary school teachers in Alexandra Township who fail to choose suitable strategies for teaching EE.

Ismail (2017) and Ruthanam, Reddy and Pillay 2021, argue that teaching about the environment is particularly challenging, because teachers fail to interpret the curriculum and the content of EE appears complex to them and furthermore, much of the environmental information is new to teachers. Such misunderstanding of EE concepts is a result of a poor EE background or lack environmental expertise among teachers as they never received training about EE (Ismail 2017; Sanders & Schoeman 2019). Sanders and Schoeman (2019) further explain that inadequacy of environmental expertise reduces

teachers' confidence, which therefore makes it hard for them to use suitable strategies to teach EE. Nevertheless, according to Ismail (2017), the challenge in teaching EE does not only emanate from teachers' lack of environmental expertise or other logistical barriers such as teaching and learning support materials and funding as indicated, as learners' poor attitudes towards EE is yet another challenging factor that inhibits teachers' success in both classroom and outdoor strategies such as designing posters and excursions. Learners do not take the content teachers teach them seriously, as they consider it secondary to their learning.

Sanders and Schoeman's (2019) study indicate a challenge related to the use of ICTs in classrooms for teaching EE. Their findings indicate that majority of teachers; explicitly about 60% of especially the older generation in Gauteng province do not know how to use modern technology as a strategy for teaching EE. However, apart from teachers' inadequacy of ICT knowledge, Sanders and Schoeman's (2019) further indicate that some schools in Gauteng province do not even have the technology equipment such as computers, projectors and internet, which makes it difficult for such schools to use ICTs as teaching and learning strategy in EE. This is a challenge as we live in today's world in which the use of technology is significant in almost every aspect of life and education is in the centre of that.

Another challenge facing primary schools is the lack of support from school stakeholders, consequently leading to insufficient funding to obtain teaching and learning support materials to support excursions and school gardening (Mawela 2020). The lack of support from stakeholders is linked with poor communication among stakeholders (Sousa et al. 2017). According to Sousa et al. (2017), lack of communication is an inhibition to the progress of the implementation of EE in primary schools. This is supported by Luiza et al. (2017), who indicate in their findings that a lack of proper communication among school community members is one of the major challenges hindering the implementation of EE in primary schools. It implies therefore that such problems with communication disrupt teaching and learning strategies such as field trips, planting trees and vegetable gardening in schools. This suggests that despite the teaching that happens in classrooms, coordinators of the committees spearheading environmental affairs in schools should practise fluent communication with the stakeholders of the schools, including learners. This would enable smooth planning and execution of such plans for environmental activities of schools.

Luiza et al. (2017) further indicate a lack of cooperation among teachers and the rest of the school community due to poor organisational structures and culture as another challenge impeding the implementation of EE in primary schools. This therefore implies

that school managers, committee coordinators as well as all stakeholders of schools need to work together, as the opposite is an obstruction to the use of the strategies as mentioned and therefore hampers the implementation of EE in schools.

Matsekoleng (2017) states that despite the efforts of teachers in using both classroom and outdoor strategies such as designing posters and litter picking for recycling to teach learners, it is still concerning that many learners' behaviours towards the environment have remained unacceptable, as they continue to litter the school environments. This makes the implementation of EE in primary schools challenging. This challenge is reiterated by Mapotse and Mashiloane (2017), stating that littering is one of the major environmental problems in several primary schools in South Africa. This is owing to the fact that many primary schools have tuck shops or vendors selling plastic-wrapped snacks such as chips and sweets as well as bottled and canned drinks, an encouraging factor for the high rate of littering in such primary schools (Mapotse & Mashiloane 2017). Litter has serious consequences for the environment due to the fact that most of the litter objects such as plastic wrappers, cans and broken bottles are non-biodegradable. Such objects therefore pose threats to plant and animal life and they are furthermore very injurious to humans. This is a huge challenge to teachers who are trying to implement EE in primary schools, as the strategies they use seem to be failing to address it. According to Mapotse and Mashiloane (2017), littering in primary schools is a phenomenon that has been researched by a number of scholars, but it still exists.

Littering, however, is not limited to only primary school premises; the phenomenon also affects other learning institutions such as high schools, colleges and universities and public places such as parks as well as marine life. It is notable that considerable efforts have been made by the stakeholders in primary schools as well as the municipalities of towns and cities to curb the environmental crises caused by littering; nevertheless, from all indications, the state of the environment has remained the same, if not deteriorating, implying that not enough has been done. Furthermore, the fact that the phenomenon has also been immeasurably studied but still persists (Mapotse & Mashiloane 2017), suggests that suitable strategies for addressing it have not been found. This therefore calls for rigorous research to further be conducted in order to fill this gap.

In the overall discussions above, the successes and the challenges regarding the strategies teachers use for implementing EE in primary schools at international, regional and national levels have been indicated. At all levels, such successes and challenges are linked to the particular strategies that teachers use in primary schools to teach EE in different contexts. Once again, it is important to emphasise that despite the extensive studies conducted by scholars on environmental challenges schools have faced over the

decades, trying to find solutions to such challenges as discussed above, a gap still exists, as the challenges or problems have persisted. Learners continuously frustrate teachers' efforts in primary schools by littering. This does not only occur in primary schools, as the state of the environment in public places such as parks and beaches in South Africa, especially in iLembe District where the researcher is based, has also remained concerning due to solid waste pollution. It indicates, therefore, that there is still a lot to be done in order to bridge the gap. This study therefore focused on the local context to explore the strategies used by primary school teachers in iLembe District to teach EE.

2.8 SUMMARY

In this chapter, various literature related to the study topic, which sought to explore the strategies used by primary school teachers to implement EE in primary schools in the international, regional and national contexts, was discussed. In the international context, a brief overview of the history of EE was given in the introduction and background by shedding light on the numerous conferences, summits and workshops attended by world leaders to stage their concerns about issues of the environment. Initiatives of UNESCO in conjunction with UNEP in forming the IEEP, which later formulated aims, objectives and guiding principles for the implementation of EE, were also discussed. This was followed by a discussion of the strategies used by primary school teachers around the world to teach EE, their successes as well as the challenges they face in relation to such strategies used for implementing EE in primary schools. This was followed by a discussion of these issues in the regional context. Finally, in the national context, a brief historical overview of the integration of EE into the curriculum was given, including the policies that have played a significant role in enforcing the integration and the subsequent implementation of EE in conjunction with the Acts and the White Paper on Education and Training was given. Following that was a discussion of how EE is implemented in South African primary schools by teachers using various classroom and outdoor strategies as well as the success and challenges teachers meet in relation to the strategies they use for teaching EE. The projects, programmes and organisations that have also supported the implementation of EE in primary schools in South Africa were discussed.

In the next chapter, the research methodology of the study is discussed, including the rationale for the empirical research, the research design and the research methods.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter covers the research methodology and elaborates on the research design, approach and methods employed in this study. The term ‘research methodology’ refers to the way of collecting and analysing data for investigating a particular research problem (McMillan & Schumacher 2010). Nieuwenhuis (2016) describes research methodology as the stratagem used by researchers for collecting, analysing and describing data to explain a phenomenon. Research methodology encompasses the procedures used to select a study site, the population and sampling as well as data collection and analysis (Matsekoleng 2017). In other words, the research methodology provides the guidelines for researchers to use as they go about collecting and analysing data. Therefore, under the research design and methods for this study, the research paradigm and approach as well as the selection of respondents, instruments used in the data collection, data analysis and establishing legitimacy of the instruments through the measures for credibility and trustworthiness are respectively discussed in this chapter. This study sought to answer

the research questions stipulated in Chapter 1, to establish whether or not the primary school teachers in iLembe District are using successful strategies for teaching EE in their schools as well as their experiences in terms of successes and challenges while using such strategies. The previous chapter shed light on the studies conducted by other scholars and the relevant knowledge they provided in the same field through a review of literature. This chapter describes how the actual research with respondents, that is, the fieldwork, was conducted for this study, explaining the rationale for empirical research for the study to justify the necessity of doing actual fieldwork rather than mere internet research. Below follows the discussion of the rationale for the empirical research for this study.

3.2 RATIONALE FOR EMPIRICAL RESEARCH

This section provides insights into the rationale for conducting the empirical research, that is, fieldwork for this study. It is important from the onset to understand what empirical research is before determining the rationale for conducting it. Bouchrika (2020) defines empirical research as a study that has its conclusions based on concrete evidence. Bell (2016) describes empirical research as a study rooted in evidence, based on observations and experiences. The aspects of empirical research that applied to this study were the events during which the researcher worked with the respondents to collect data through observations and interviews. According to Bouchrika (2020), the idea of empirical research originated from a group of ancient Greek medical practitioners who saw the importance of depending on observed phenomena rather than sticking to dogmatic principles. This idea of empirical research later became a theory of knowledge, empiricism, in philosophy, which emphasises that knowledge comes from sensual evidences and experiences (Bouchrika 2020). This is very much in line with the theory used for this study, that is, the experiential learning theory of David Kolb. According to Kolb (2015), experiential learning theory elucidates a specific form of learning where an individual learns from life experiences, which therefore justifies the reason for conducting actual fieldwork with participants. Empirical research is important for the reason that it tests theories and makes them practical and real (McShane & Lueken 2018). Nieuwenhuis (2016) states that the aspects of empirical research such as observations and interviews are vital in qualitative research, as they help researchers to obtain rich information or data that enable them to have a deeper understanding of the phenomena being studied. In a nutshell, the aspects of empirical research in this study contributed by providing detailed and rich information that supplemented the data gathered through internet research. This therefore explains the rationale for the aspects of empiricism in this study. Below follows a discussions of the research design for this study.

3.3 RESEARCH DESIGN

This section covers the research design for this study, discussing the research paradigm and approach as well as the population and sampling used in the study. A research design describes the procedures for conducting a study, including the time, participants and conditions for collecting data (McMillan & Schumacher 2010). In other words, it has the purpose of specifying the overall plan of the study. Although qualitative designs are as systematic as quantitative designs, there are distinctions between them in terms of their type of designs as well as the methods of gathering and presenting data (McMillan & Schumacher 2010). For instance, qualitative designs accentuate gathering data on naturally occurring phenomena and the data are presented in words, while quantitative designs emphasise objectivity to measure and describe phenomena by using statistics, structures and control, and the data are presented in numerical form (McMillan & Schumacher 2010).

According to McMillan and Schumacher (2010), just as in quantitative research, there are several research designs in qualitative research. These include ethnography (studying cultures or social systems), phenomenology (describing meanings of lived experiences), case studies (examining a single entity), grounded theory (examining a phenomenon relating to a theory) and critical studies (describing non-traditional perspectives, theories and approaches) (McMillan & Schumacher 2010). Each of the designs in qualitative research follows a methodology that suits the design (Nieuwenhuis 2016). It is the responsibility of the researcher to choose a design that is appropriate to his or her research question and philosophical underpinning and to consider the appropriation to generate the required data to answer the research question. In this regard, phenomenology was used for this study as a design under the qualitative research approach. According to McMillan and Schumacher (2010), phenomenology describes the meaning for a number of individuals of their lived experiences of a phenomenon. McMillan and Schumacher (2010) add that phenomenology is characterised by long or in-depth interviews conducted by researchers to understand the perspectives of people about a specific phenomenon and their lived experiences of it. The aim of this is to enable researchers to describe the essence of the lived experiences of people in relation to the phenomenon being studied (McMillan & Schumacher 2010). Phenomenology was chosen as the design for this study because it falls under the guidance of the philosophical assumption of interpretivism, which advocates for subjective interpretation of human beings and their perceptions of the world in which they live (Leedy & Ormrod 2010). The design is also very much related to the theory of this study which stresses learning through experiences (see Kolb 2015), hence increasing its appropriation to this study. In this light,

this design was therefore deemed suitable for this study, as it investigated the experiences of primary school teachers with regard to the use of strategies for teaching EE.

Below follow the discussions of the research paradigm, research approach, the population and the sampling of this study.

3.3.1 Research paradigm

A research paradigm is a set of presumptions about underlying aspects of reality that engenders a specific philosophy of life (Nieuwenhuis 2016). Perera (2018) describes a paradigm as a set of conventional beliefs and agreements held by scientists regarding the way problems should be comprehended and addressed. According to Rehman and Alharthi (2016), a paradigm can simply be referred to as the way of comprehending the reality of the world and studying it. While Perera (2018) indicates that there are a number of research paradigms, such as positivism, post-positivism, critical theory, pragmatism and constructivism, also referred to as interpretivism, McMillan and Schumacher (2010) point out post-positivism and interpretivism from the existent paradigms as the two major ones that provide grounds for educational research in respect of quantitative and qualitative approaches. Kivunja and Kuyini (2017) claim that a research paradigm consists of four components or elements, which are epistemology (concerns the bases of knowledge, its nature, forms and how it is acquired and communicated), ontology (deals with the nature of existence or reality), methodology (encompasses the research design, methods, approaches and procedures used for data collection and analysis) and axiology (concerns the ethical issues of research).

According to Kivunja and Kuyini (2017), before choosing a paradigm for research, it is imperative that researchers have a clear understanding of the assumptions, beliefs, norms and values of the paradigm, which provide guidance to the research. This therefore implies that researchers are urged to choose paradigms that are suitable to their research considering the appropriation with particular research design. In this regard, interpretivism was chosen as the paradigm for this research. This was because the researcher intended to interpret the reality subjectively from the perspectives of the respondents; in this case, the researcher was establishing the experiences of teachers in terms of successes and challenges of teaching EE. This means that the researcher, as considered an insider in this case, was pursuing an internal reality since the study is qualitative and the researcher was not detached from the phenomenon under study as in the case with quantitative study. As Kivunja and Kuyini (2017) put it, interpretivism as a philosophical underpinning strives to provide comprehension of the subjective world of human experience. It makes

the effort of understanding and interpreting the experiences of people within a given context (Kivunja & Kuyini 2017). In this light, there is an indication that a strong link exists between the interpretive paradigm and the theory of this study as the ELT advocates learning from experiences (see Kolb 2015), hence emphasising the appropriation of interpretivism as a paradigm for this study.

Rehman and Alharthi (2016) claim that interpretivism emerged as a reaction to the over dominance of positivism. Interpretivism refutes the conception that there is a single confirmable reality independent of human senses and dismisses the notion of the existence of a universal truth (Rehman & Alharthi 2016). According to Rehman and Alharthi (2016), interpretivists believe that there are numerous realities and that they are socially constructed. This statement is strongly supported by Maree (2016), who states that reality is not one but many. In other words, there is neither a single reality, nor is there a universal truth. This implies that truth is relative, subject to individual perception of every phenomenon. According to McMillan and Schumacher (2010), researchers who follow the interpretive paradigm use systematic procedures; however, they uphold the belief that realities are multiple and socially constructed. This study followed the interpretive paradigm for the reason that the qualitative approach and its designs, especially phenomenology, are strongly supported by the philosophical underpinning of interpretivism (Walliman 2018). It therefore made the phenomenological design suitable for this study, as it was employed to discover the experiences of primary school teachers and their views or opinions on implementing EE.

3.3.2 Research approach

Grover (2015) describes a research approach as the plans and procedure for research that include the steps from broad assumptions to detailed methods of data collection, analysis and interpretation. Chetty (2016) concurs that a research approach is a plan that comprises the steps of broad assumptions and the overall methodological procedure of the research from data collection to the interpretation of data. According to Chetty (2016), the choice of an approach for research is informed by the kind of research problem to be studied. This implies that the responsibility lies with the researcher to make an informed decision, based on the particular research problem, while choosing an approach for the research.

According to McMillan and Schumacher (2010), there are primarily two main approaches to research, namely quantitative and qualitative. However, several researchers have combined the two approaches for their studies, giving birth to the mixed-methods approach as the third approach (McMillan & Schumacher 2010). The qualitative approach

differs from the quantitative and mixed-method approaches in many ways, as indicated in Table 3.1. This study followed a qualitative approach. A qualitative research approach is an inquiry process that emphasises in-depth understanding of a phenomenon from participants' perspectives, which encourages the collection of data on naturally occurring phenomena, with the data written in words (Ivankova et al. 2016). According to Basias and Pollalis (2018), qualitative approach has a number of advantages over the other approaches such as quantitative and mixed methods in the following ways: a) permitting the comprehension of the nature and complexity of the phenomenon being studied, b) promoting research in new areas, c) encouraging the exploration of a phenomenon in its natural environment and d) promoting in depth research. In this light, the qualitative approach has been chosen for this study as it has the capability of interpreting and describing phenomena (McMillan & Schumacher 2010). Under this approach, the phenomenological design, which focuses on the understanding of the essence of a reality (Jansen 2016), was followed by this study, as supported by experiential learning theory, which accentuates the significance of experiences in the learning process (Kolb 2015). This learning theory therefore made the qualitative approach and the phenomenological design suitable for this study, as it greatly assisted in data collection by discovering the experiences of primary school teachers and their views on the strategies they use for teaching EE. Apart from aiding in the data collection process, experiential learning theory is greatly in support of teaching and learning strategies such as group discussions and projects used by teachers to teach EE in schools (Kolb 2015), which therefore reinforced the significance of the relationship among the research approach, design and theory for this study.

Table 3.1: Differences in qualitative, quantitative and mixed-methods approaches

Orientation	**Qualitative**	**Quantitative**	**Mixed-methods**
Assumptions of the world	Multiple realities by interviews about a social situation	A single reality measured by an instrument	Philosophical foundation of pragmatism that combines both multiple and single realities through the use of interviews and instruments
Research purposes	Understanding a social situation from participants' perspectives	Establishing relationships between measured variables	Collecting both qualitative and quantitative data in response to a research

			question for broader and deeper understanding and collaboration
Research methods and process	Flexible, changing strategies; design emerges as data are collected	Procedures are established before the study begins	Persuasive and rigorous procedures for the qualitative and quantitative methods; involves drawing a procedural diagram to comprehend the complex nature of a phenomenon
Research role	Prepared persons become immersed in a social situation	Detached with the use of instruments	Integrating two data sources by merging, connecting and embedding; researcher is both immersed and detached at particular stages
Importance of context	Goal of detailed context-bound summary statements	Goal of universal context-free generalisations	Involves aspects of goals of both context-bound and context-free summary statements and generalisations

Source: McMillan and Schumacher (2010), Kaur and Chandigarh (2015), Ivankova et al. (2016)

3.3.3 Population and sampling

The term ‘population’ refers to the group of individuals or elements from which data are collected (McMillan & Schumacher 2010). It refers to an entire group of individuals, elements or objects to which results of the study can be generalised (McMillan & Schumacher 2010). It is from the general population that a group of individuals or respondents is selected or drawn to collect data from for the study. The population in the context of this study comprised primary school teachers from three schools, out of whom the respondents for this study were selected.

Regarding the sample size for qualitative research designs, Nieuwenhuis (2016) recommends the appropriate number of respondents for phenomenological design to be

at least six. This recommendation is supported by Maree and Pietersen (2016), who state that a smaller sample size is adequate to represent a homogeneous population, which as considered for this study, refers to the primary school teachers. For this study, therefore, a total of six teachers were sampled as the respondents for data collection to get rich information that assisted in answering the research question. Two teachers, that is, a grade 3 and 6, were selected from each of the three primary schools that were members of the Eco-Schools programme. The researcher took into consideration the issues of accessibility in terms of distance and conditions of the roads, which therefore resulted in the choice of the three primary schools out of the five that were members of the Eco-Schools in the district. According to McMillan and Schumacher (2010), the term 'sampling' describes the techniques and procedures for selecting respondents. In other words, sampling refers to the process used by researchers to select or draw respondents from the general population for the purpose of collecting data. Purposive sampling, which is a non-probability sampling, also known as judgmental, selective or subjective sampling (Maree & Pietersen 2016), was used as a technique for selecting the respondents for this study. Purposive sampling, as the name suggests, is when a researcher selects respondents with a 'purpose' from the general population to represent a phenomenon, group, incident, location or type in relation to a key criterion (Maree & Pietersen 2016). According to Nieuwenhuis (2016), there are different types of purposive sampling such as typical case sampling, extreme case or deviant sampling and critical case sampling among others. However, homogeneous type of purposive sampling was used in the process of selecting respondents for this study because the samples had the same background in terms of being affiliates of Eco-schools programme (see Nieuwenhuis 2016). Purposive sampling was chosen for the reason that it allows the researcher to obtain the desired information about the topic of the study from particular members within the population (McMillan & Schumacher 2010). With the purposive sampling technique, the researcher does not use probability in choosing the respondents, but his or her own judgement, as the researcher is convinced that the chosen respondents are well informed and will provide the required information about the topic under study (Dudovskiy 2019). This technique was therefore deemed appropriate for this study, as specific teachers from the selected schools that were thought to be able to provide desired information for the study were chosen. In light of this, the three primary schools chosen were among the only five schools in iLembe District, KwaZulu-Natal that had participated in the Eco-Schools programme. One of the three schools became a member of the Eco-Schools programme from as early as 2009 while the other two joined the programme in 2013. All the schools remained active members of the programme up to 2017 when the programme eventually ended its engagement with the schools in iLembe District, leaving the schools with on-

going Eco-Schools activities at the time of this study. Furthermore, the three schools chosen were situated in different locations, namely rural, farm and township. The reason for this is that the researcher had the intension of comparing the implementation of EE in primary schools with different environmental backgrounds in order to gain a better understanding of the problem being investigated.

3.4 RESEARCH METHODS

Research methods in a simple way refer to the tools**,** instruments or techniques employed by researchers for data gathering. This is explicitly put by Nieuwenhuis (2016, p. 51) as quoted:

> Methods are the tools that researchers use to collect data. These tools enable researchers to gather data about social reality from individuals, groups, artefacts and text in any medium.

There are many research methods (Nieuwenhuis 2016); nonetheless, depending on the research topic, questions and goals, different research approaches use different methods of collecting data, although some methods may apply to more than one approach. For instance, quantitative researchers mainly use experiments, questionnaires and surveys for collecting data, while qualitative researchers mostly use in-depth one-on-one interviews, focus group discussions and document analysis (McMillan & Schumacher 2010). However, both approaches also use observations as a method to collect data (McMillan & Schumacher 2010). This section covers the tools or techniques, namely interviews, non-participant observations and document analysis, used by the researcher to gather data for this study, the analysis and interpretation of the data, measures for credibility and trustworthiness and ethical considerations.

3.4.1 Data collection techniques

Three data collection techniques were used to gather data for this study, namely interviews, non-participant observations and document analysis, which are discussed below.

3.4.1.1 Interviews

An interview is a conversation between two individuals, one of which is the interviewer and the other a respondent, where the interviewer asks questions for the respondents to answer in order to collect data (Nieuwenhuis 2016). In-depth one-on-one interviews were used as the main instrument for gathering data for this study. The interviews were conducted under the guidance of strict Covid-19 regulations. The questions for the

interviews took the form of open-ended questions semi-structured questions, where the questions were phrased to allow for individual responses, but within a specific intention of the researcher (see McMillan & Schumacher 2010). A journal and a voice recorder were used during the interviews to note down and record the responses of the participants.

3.4.1.2 Non-participant observations

Initially, non-participant observations were planned to be one of the three data collection techniques. However, the observations turned out to be conducted in the form of site visits as previously explained in section 1.6.3.2 in chapter one. The site visits were conducted to establish whether gardens were set up for use by teachers as EE teaching resources and whether recycling activities took place. Strict regulations of covid-19 safety measures were followed during the site visits as highlighted in the aforementioned section 1.6.3.2. The researcher used a journal for taking notes and took pictures of the available activities of EE during the site visits. This was done because, as stated by Nieuwenhuis (2016), in-depth interviews and observations are complementary. Therefore, by observing the school premises, rich understanding of the phenomenon under study was obtained, as stated by McMillan and Schumacher (2010). In other words, establishing the evidences of the environmental activities that took place on the school premises was vital for this study, as it complemented the data collected from the interviews and the document analysis.

3.4.1.3 Document analysis

Document analysis, also known as artefact collection, is a non-interactive strategy of collecting data from documents for a particular study (McMillan & Schumacher 2010). This in other words means that there is no physical interaction between the researcher and the respondents. This method was considered as one of the techniques for this study because according to Buthelezi (2015), it helps the researcher to check the documents that contain information pertaining to the phenomenon being studied. According to McMillan and Schumacher (2010), artefacts analysed by researchers include minutes of meetings and working papers, among others. Nieuwenhuis (2016) states that researchers analyse both published and unpublished documents, originating from primary and secondary sources respectively, which include reports, letters, faxes, emails, newspaper articles and journals, among others. For this study, such documents included the environmental guides that are issued by NGOs such as Eco-Schools; the Eco-Schools portfolios containing audits as well as lesson plans and minutes of meetings in the participating schools that were members of the Eco-Schools programme; documents

such as the CAPS issued by the DoBE; as well as the school-designed environmental policies for the implementation of EE The same Covid-19 protocols as explained above were observed during the process of document analysis. The data gathered from all the sources were then analysed and interpreted for reporting purposes.

3.4.2 Data analysis and interpretation

The qualitative data gathered through document analysis, interviews and observations were analysed through an inductive process, as recommended by McMillan and Schumacher (2010). All the documents regarding environmental policies in the schools' possession were analysed. Notes taken during interviews as well as voice recordings were read and listened to several times respectively in order to make sense of them. This was then compared with the data collected during the site visits to find a relationship or link through the process of triangulation (see Maree 2016). According to Maree (2016), some scholars prefer the term 'crystallisation' to triangulation, which refers to the use of different methods to collect data for a study to enhance trustworthiness. McMillan and Schumacher (2010) state that the collected data should be carefully read through and organised in a way so as to transcribe them into segments, after which the data should be coded and placed in categories. This was done for this study in order to assign meanings to the data through the process of complete coding (see Nieuwenhuis 2016). In light of that, all the data were initially coded by identifying, underlining and colouring each text and only later in the process of analysis did the researcher become selective while summarising and searching for relationships and patterns, upon which the data were grouped into themes which were studied and revised (see McMillan & Schumacher 2010) in order to make sense for the purpose of presenting the findings. The data were then interpreted for the purpose of synthesis so as to find a logical order to describe the essence of the phenomenon being studied (see McMillan & Schumacher 2010). Interpretation in this case was done by developing patterns and associations as well as defining and giving in-depth explanations of concepts in the data in order to make comprehensive meaning (see Nieuwenhuis 2016).

According to Nieuwenhuis (2016), the analysed and interpreted data should be able to move the researcher to a point of understanding in order to draw concrete conclusions from the findings, which was the case for this study. This is due to the fact that the credibility and trustworthiness of the data rely heavily on the data analysis, interpretation and conclusions based on the findings. Credibility and trustworthiness for this study are discussed below.

3.4.3 Measures for trustworthiness

The term ‘reliability’ describes the possibility of using the same measures by different researchers to generate the same results (Maree 2016). Meanwhile, validity in qualitative study refers to the level of consistency between the explanations of the phenomena and the realities of the world (McMillan & Schumacher 2010). Although reliability and validity are to quantitative studies as credibility and trustworthiness are to qualitative studies, some authors refer to trustworthiness as validity in qualitative research. However, for the sake of clarity, as this study was qualitative, the focus here was on credibility and trustworthiness, which were addressed under the concepts of credibility, transferability, dependability and conformability.

The term ‘credibility’ refers to the degree of consistency between the findings of the study and the reality under study (Korstjens & Moser 2018). According to Nieuwenhuis (2016), credibility is achieved by adopting well-entrenched research methods, a design that is appropriate to the research question and a theoretical framework that provides a ground for the research questions and methods to fit in. In light of this, appropriate methods for selecting participants, data collection as well as analysis of data were chosen. Purposive sampling was chosen to select participants who were considered suitable to provide a wealth of information during the in-depth interviews that would assist in answering the research questions. Document analysis and observations were also employed to supplement the data collected during the interviews. The inductive process of data analysis was used, as it is mostly preferred by researchers who follow an interpretive paradigm (Jansen 2016). All this would assure the readers of the credibility attached to this study.

Transferability was also considered to evaluate the results of the qualitative data to test whether the results could be used to describe wider or different populations. This was done with regard to the typicality of the respondents to the context being studied as well as the application of the findings to the context of the study (see Korstjens & Moser 2018). By using purposive sampling, it was ensured that the respondents were suitable for this study, as primary school teachers were sampled. The study also took place in schools that were members of Eco-Schools, which provided a suitable context to the topic under study.

Dependability was also taken into consideration to ensure that other researchers would be able to rely on the findings of the study for their reference. Dependability was manifested in proper administration of the research design, data gathering and analysis (Korstjens & Moser 2018). In light of this, it was ensured that the journals in which the notes were taken during interviews and observations were kept safely for reference. In

addition, it was also ensured that the records of the process of analysing the data were well documented so that readers or other researchers might see how the researcher had gone about the analysis and interpretation of the data.

Conformability is referred to as the extent to which the researcher stays neutral with regard to the research findings (Nieuwenhuis 2016). In other words, it is the level at which the involvement of the researcher and the respondents is measured in relation to the research findings to control the influence of the researcher as far as bias and personal interest are concerned. With that in mind, it was ensured that three different methods of collecting data were used, namely in-depth interviews, observation and document analysis. This was done to reduce researcher bias and also to avoid problems caused when the study depends on only one source of data collection. Furthermore, it was ensured that the researcher had limited physical involvement with the research respondents. An audit trail was also used as a mechanism to reduce bias by tracing the course of the study in terms of the decisions made and procedures followed as recommended by Nieuwenhuis (2016).

Credibility and trustworthiness for this study were also ensured through triangulation. Triangulation refers to using multiple data sources and data collection techniques at different times while gathering data for a particular study (McMillan & Schumacher 2010). According to Maree (2016), the collection of data from various methods or techniques reduces bias. In this regard, three data collection techniques, namely interviews, observation and document analysis, were used for this study. Through the use of such a variety of techniques, consolidation in data was obtained, which therefore ensured the credibility and trustworthiness of the study.

3.4.4 Ethical measures

Research ethics concerns what is right or wrong from a moral perspective. As this was an educational research project, the researcher had to be fully aware that he would be dealing with people and information. Therefore, all the ethical and legal responsibilities as previously discussed in section 1.8 had to be considered.

3.5 SUMMARY

This chapter covered the methodology of the research in which the rationale for the empirical research; the design of the research, which includes the research paradigm and approach; as well as the research methods, which encompassed the procedures for selecting the study site, population and sampling, techniques of data collection and

analysis and interpretation were discussed. In addition, the trustworthiness of this study as well as the ethical considerations that were vital to consider before commencing with the investigation was also discussed. The following chapter presents the data analysis and interpretation and a discussion of the findings.

CHAPTER 4: DATA PRESENTATION, ANALYSIS AND DISCUSSION OF FINDINGS

4.1 INTRODUCTION

The previous chapter presented the research methodology for this study. This chapter entails the data presentation and analysis of this study based on the main research question as stated in Chapter 1, namely “What strategies do primary school teachers use to teach EE in primary schools in iLembe District?” The collected data were therefore intended to answer this research question. The researcher employed three data collection methods, namely one-on-one interviews, non-participant observations and document analysis, in order to explore the strategies primary school teachers in iLembe District used for teaching EE and their experiences while using such strategies to teach EE.

Below follows a discussion of the process the researcher followed during the data collection for this study as well as the data presentation and analysis.

4.2 DATA COLLECTION PROCESS, PRESENTATION AND ANALYSIS

This section describes in detail the procedure followed in data collection and the development and the utilisation of the data collection instruments in the event of collecting data for this study. It further elaborates on the presentation and analysis of the data for this study. The subsection below describes the process the researcher followed during the data collection.

4.2.1 Data collection process

Firstly, the researcher identified three primary schools from the five schools that were members of the Eco-Schools programme, and sampled six teachers, that is, two from each of the three schools for the interviews as previously explained in section 3.3.3. After

that the researcher then developed the data collection instruments, that is, the interview questions as well as the observation schedule, which were intended to go hand in hand with document analysis. Due to the Covid-19 pandemic, the observations took place outside in the school premises. The researcher's intention for observing the school premises was to establish whether the schools were using cleaning and greening strategies such as recycling and planting of vegetables, trees and flowers to teach EE to learners.

Secondly, the researcher applied to the University of South Africa's (Unisa) College of Education Ethics Review Committee for ethical clearance, which was granted. Thereafter, the researcher applied to the KwaZulu-Natal provincial department of education head office and wrote a letter each to the district director and the circuit manager requesting permission to conduct research in the three sampled primary schools located in iLembe District. On receiving permission from the KwaZulu-Natal provincial department of education, the researcher then emailed letters to the principals and the school governing body chairpersons of the sampled schools, seeking their permission to allow the researcher to visit their schools for the purpose of data collection. The researcher thereafter contacted the principals of the selected schools telephonically to follow up on the sent emails and also to set dates for visits to the respective schools.

The researcher then visited the participating schools and the six teachers from the aforementioned grades in the three schools were interviewed, the school premises were observed and documents were analysed for the purpose of collecting data for this study. Given the fact that the data collection activities took place during the surge of the third wave of the Covid-19 pandemic, all the protocols of safety measures against Covid-19 were strictly observed.

The following is a subsection that explains the methodological approach for this study.

4.2.2 Methodological approach

This subsection presents collated data across the three data collection methods and the experiential learning theory constructs that assisted in the process of data analysis. The data collected from in-depth one-on-one interviews, non-participant observation and document analysis revealed strategies that were used by teachers for implementing EE. The data were triangulated and summarised to validate the findings of this study. The analysis was done with reference to the four main concepts or constructs namely: concrete experience; reflective observation; abstract conceptualisation and active experimentation on which the experiential theory was founded (see Kolb 2015) as previously introduced in chapter 2. The following table 4.1 shows the triangulation and

summary of the findings from the aforementioned methods based on the constructs from the experiential learning theory.

Table 4.1 collation of data across the data collection methods based on ELT

Constructs	Interviews	Observations	Document analysis
Concrete experience (feeling) Refers to learning through encountering new experience or reinterpreting an existing experience	Teachers' experiences indicated success in controlling litter and planting trees to ensure clean and green school environment	School premises were clean and green	Lesson plans and photos of cleaning and greening activities such as picking litter and planting trees were in Eco-schools and SEEP portfolios as well as in teachers' files.
Reflective observation (watching) Refers to learning through the sense of sight or by watching; trying to understand what has been experienced	Teachers showed videos of polluted areas to leaners and took them on field trips to bird park and botanical gardens	Availability of recycling bins, vegetable gardens and indigenous trees in schools	Photos of recycling and gardening activities. Gardens used as teaching resources in lesson plans
Abstract conceptualisation (thinking) Refers to learning through forming new ideas and making conclusions based on what has been experienced and reflected on	Teachers engaged learners in river and beach cleaning. Refer to photo 4.9 in the appendices	School premises were free of litter	Photos of river and beach cleaning in Eco-schools and SEEP portfolios. Refer to photo 4.9 in the appendices
Active experimentation (doing) Refers to learning through doing. Being actively involved in practical learning tasks such as gardening and recycling.	Teachers engaged learners in outdoor activities such as vegetables and tree planting as well as compost making and recycling	Vegetables, trees, compost and recycling bins were available in the schools	Policies in CAPS document, lesson plans in teachers' files, Eco-Schools and SEEP portfolios as well as photos indicated evidences of practical activities

Constructs adapted from Kolb (2015)

The subsection below presents the data obtained from the interviews.

4.2.3 Data from interviews

Taking into account the issues of confidentiality with regard to ethical protocols, as stated by Buthelezi (2015), the participating schools and teachers were given pseudonyms and accordingly, the schools were listed as Abiria primary, Luge primary and Celina primary. The sampled teachers were named as: Mr Itto referring to a Grade 3 teacher from Abiria primary, Mrs Atutu to a Grade 6 teacher from Abiria primary, Ms Jua is a Grade 3 teacher from Luge primary, Ms Loria is a Grade 6 teacher from Luge primary, Mr Amoko is a Grade 3 teacher from Celina primary and Mr Masurubu is a Grade 6 teacher from Celina primary.

Table 4.2 summarises and indicates the number of teachers interviewed per participating school.

Table 4.2: Number of sampled teachers in the participating schools

PARTICIPATING SCHOOLS	**SAMPLED TEACHERS**	**NUMBER OF SAMPLED TEACHERS PER SCHOOL**
Abiria primary	Mr Itto and Mrs Atutu	2
Luge primary	Ms Loria and Ms Jua	2
Celina primary	Mr Amoko and Mr Masurubu	2
TOTAL		**6**

Interviews were used as one of the three techniques to collect data for this study as discussed in the previous sections 1.6.3.1 and 3.4.1.1, in chapter one and three respectively.

The teachers had varied responses to the interview questions; however, with significant similarities and differences. It is important to note here that although there were two categories of teachers from different grades, that is grades 3 and 6, as previously indicated, the three participating schools were members of the Eco-Schools programme, through which they learnt much together, which explains why there were more similarities in the strategies teachers used in these schools than differences. It should also be made clear that apart from being members of Eco-Schools, some schools joined other programmes such as the School Environmental Education Program (SEEP) and Umhlali country club, among others, which supported them. The teachers' responses are indicated below under different themes related to the interview questions.

4.2.3.1 Strategies used to teach environmental content in primary schools in iLembe District

The responses of the teachers indicated that teachers from the same school had almost the same ideas about the strategies of teaching EE, with little difference from the teachers from the other schools. They all indicated that they used a variety of strategies for teaching EE that were both classroom and outdoor activities, such as designing posters (refer to photo 4.10 in the appendices), role plays, showing videos, field trips, picking up litter, recycling, vegetable gardening and planting of trees.

Regarding indoor strategies, teachers indicated that they integrated EE with other subjects they taught. For instance, Mr Itto, Ms Loria and Mr Amoko explained that in Life Skills for Grade 3s, as the learners are younger, they taught them water-saving skills by asking them to design posters, showing learners pictures from newspapers or magazines and showing them videos about the effect of littering, from which they learnt a great deal. Apart from the aforementioned classroom strategies, Ms Jua and Mr Masurubu both indicated for older learners such as those in Grade 6s, they used strategies such as designing posters in Social Sciences and Life Skills; essay writing, especially in the language subjects on environmental issues such as littering as well as debating on topics such as the impact of littering on human health. Such strategies encourage learners to express their experiences or feelings and the opinions about the impact of littering as supported by concrete experience and abstract conceptualisation, two of the founding concepts or constructs of ELT of David Kolb (see Kolb 2015).

Mr Itto and Mrs Atutu explained that they sometimes took learners to the nearby river to clean it, because the school is situated in a rural area and the community often drank from the river whenever there was a shortage of water. According to them, the river was mostly polluted by waste materials such as plastic bags and bottles, glass bottles and cans. The school therefore decided to clean the river from time to time so that the community could have clean water for domestic use in times of water crisis.

They also used to do beach cleaning, from which learners learnt. Through this, learners were taught about the importance of cleaning the beach, namely that it is firstly significant for them to learn about keeping the environment clean; secondly, the beach is visited by tourists who contribute to the economy of the province and the country. Furthermore, keeping the beaches clean is an effort of ensuring the sustainability of ecosystems, which is of a great importance, as the marine world is also part of our environment.

Another outdoor strategy, according to one teacher, is asking learners to collect litter from the school compound, which educates learners about the importance of a clean and safe environment. Ms Jua further explained this saying that every day after break they asked learners to collect the papers from the school compound, because their school had a tuck shop from which learners bought sweets and chips to eat during break time. The litter was

sorted out for recycling. So, picking up litter helped learners to learn that the school environment needs to be clean. The strategies aforementioned of river and beach cleaning as well as picking litter are all supported by the experiential learning theory of David Kolb under the construct of active experimentation (see Kolb 2015). This is where leaners put into action what they have experienced, felt or thought about. School gardening and planting of trees are essential aspects of greening the school environment, which all the schools indicated to be practising with their learners. For instance, Mrs Atutu stated as follows:

> *Since our school has been part of Eco-Schools programme, we have learnt a lot of outdoor strategies to use for teaching. One of them that I always find effective is to take the learners to the gardens, make practical lessons on how to do permaculture to plant vegetables. Or I take them to the medicinal garden we have at school where they learn about nature and the importance of those medicinal trees to the ecosystem as well as to humans.*

Teachers also indicated that they practised other outdoor strategies such as recycling and reusing of waste through which the idea of the 3Rs is effected, and from which they benefited significantly. Mr Masurubu further explained as follows:

> *We collect paper from our school, especially the old books, and also our learners collect paper from the school compound during break time and from the surrounding community which we sort and gather in recycling bags and a recycling company used to come and collect. They then supplied us with toilet tissues in return. In Natural Sciences and Life Skills, we ask learners to reuse waste materials for making things such as masks, pencil-cases, houses and many more. Our learners learn that recycling and reusing wastes keeps our environment clean.*

Despite the fact that most of the teachers used similar strategies for teaching EE, for other teachers such as Ms Loria and Ms Jua, teamwork and networking with other schools also served as a strategy. Ms Jua explained that networking with other schools, especially those that were also members of the Eco-Schools programme, allowed them to share information on how other teachers integrated EE into their lessons and what they did in their school gardens.

However, the teachers pointed out that ever since the Covid-19 pandemic started, things had never been the same. As from March 2020 to date, some of the strategies had been difficult for teachers to practise due to following Covid-19 rules and regulations. Activities such as recycling and school gardening, especially at Abiria primary and Celina primary were managed by hired gardeners while Luge primary did not hire any gardeners at the

time of the study**.** For instance, Ms Jua indicated that since the outbreak of the Covid-19 pandemic last year, they had been limited in terms of outdoor strategies such as field trips and gardening. Ms Jua stated as follows:

> *We used to take our learners for field trips, and also do gardening in our school, but ever since the outbreak of [the] Covid-19 pandemic, from last year we don't go for field trips and also we are not doing school gardening.*

4.2.3.2 Type of teaching and learning support materials used to teach environmental content in primary schools in iLembe District

Teachers from the three schools responded differently on the issue of resources they used for teaching EE, although with considerable similarities in the resources. For instance, all six teachers mentioned the use of resources such as textbooks, charts, magazines, newspapers, worksheets, computers and projectors to show videos to learners and posters in the classrooms in their respective grades. Mrs Atutu particularly indicated that, according to her, the gardens as well as the trees and medicinal plants they had in their school were also part of the teaching and learning support materials through which they explained environmental content to their learners. According to her, the garden tools such as water canes, hoes and spades were also part of the resources.

It became clear that being part of the Eco-Schools programme had been of great benefit to the member schools in terms of provision of resources that teachers used for teaching learners. Mrs Atutu explained as follows:

> *Our school was a member of the Eco-Schools and later we joined the SEEP; we have received various resources like pamphlets and charts containing environmental information which we use to explain environmental aspects related to Natural Sciences, Social Sciences and also English in Grade 6 classrooms, and also garden tools with seeds and seedlings which we use in the gardens for planting, and our learners learn practically from it*.

4.2.3.3 Support schools received from the Department of Basic Education and other governmental and non-governmental organisations regarding the implementation of environmental education in iLembe District

The teachers had varied responses to the question of schools receiving support from government or NGOs. According to Mr Amoko and Mr Masurubu, apart from the textbooks and few charts with environmental contents the DoBE provided, they did not receive any other material support from the DoBE or other governmental departments or organisations. However, they both indicated that they received support from subject

advisors in the form of mentoring. These two teachers indicated that they used to get support from the Eco-Schools programme that supplied them with seeds, seedlings and garden tools and also organised workshops to train them on how to do planting and look after the trees. These trees provided shades for learners during break times and reduced the risk of wind to blow the school roofs off.

On the other hand, apart from the provision of textbooks and charts by the DoBE, which seems to be a general support to all the primary schools, Mr Itto, Mrs Atutu, Ms Loria and Ms Jua all indicated that they received support from the DFFE, the Eco-Schools programme as well as SEEP in the form of provision of seedlings and garden tools. Mr Itto further explained as follows:

> *We used to get support from the Eco-Schools programme and SEEP, as they organised workshops to train us on how to implement EE in our school and how to do permaculture. We also received recycling bags from the local municipality to collect and sort out litter for recycling. Apart from being a member of the Eco-Schools and SEEP, our school is currently affiliated with Umhlali Country Club, which is providing us with seedlings and garden tools. But also on Arbor Day usually the DFFE provides the school with trees to plant.*

The support schools received clearly depended on the types and number of NGOs with which the schools were affiliated. Apart from the support from government departments, the more NGOs are attached to a school, the more support the school receives.

4.2.3.4 Conservation of natural resources at schools in iLembe District

All the teachers exhibited adequate understanding of what natural resources are and what they do to conserve them. This however differed from school to school depending on the activities taking place in the respective schools. The natural resources the teachers indicated to be conserving included water, energy, soil and trees as well as flowers. All the teachers indicated that they had water tanks at their schools to harvest rainwater and that they saved electricity by switching off lights while not used. Ms Loria further explained as follows:

> *We are a farm school and sometimes the water from the municipality runs out, so we have the JoJo tanks, which help us to harvest rainwater and store [it]. We used this rainwater to water our plants in the school gardens in the previous years and also sometimes our cooks use the water to wash dishes*. *We also switch off the lights in our classrooms, staffrooms and toilets and everywhere, except on cloudy days when it is dark*.

According to Mr Amoko and Mr Itto, they also do everything possible in their schools to prevent wastage of water and electricity. Mr Amoko further explained that in their school they ensured that water and electricity were not wasted. He pointed out that they did not allow learners to open taps and let the water keep running when they drank or washed their hands. In addition to that, most of the times their lights were off and only used when really necessary. Mr Itto indicated that before the outbreak of Covid-19 they had a bucket of water at the door of every classroom with a cup from which learners drank. However, this practice was stopped due to Covid-19. They now asked learners to bring their own water from home to avoid infections. Mr Itto also indicated that they used tippy taps, which is a simple, locally made device that was introduced by the Eco-Schools programme, for learners to wash their hands, which prevented the wastage of water.

Apart from conserving water, Mr Itto and Mrs Atutu indicated that they conserved the land by planting grass and trees. Here is what Mr Itto explained:

> *We remove alien trees and plant trees, some of which are indigenous trees which are also medicinal, while others are fruit trees and the rest are only flowers for beautification and conservation of the land. We also plant grass to prevent soil erosion, because our school is situated on a sloppy land.*

4.2.3.5 Success in using strategies for teaching environmental content in the primary schools in iLembe District

There was an indication that the teachers experienced successes in their schools as a result of using strategies for teaching EE. Their responses were varied, but mostly centred around environmental knowledge, skills and values acquisition by learners that learners practised in real life, water saving at school, schools being cleaned and greened as well as fundraising for the schools through recycling. Mr Amoko and Mr Masurubu stated that learners had acquired some knowledge, skills and values from what they had taught them to use in real life. Mr Masurubu further mentioned that some learners reported to him that they also had vegetable gardens at home. They also planted trees and flowers at home, while other said they had rubbish bins at home and their families were participating in recycling by collecting bottles, cans, paper and plastics to sell to a recycling company, which earned them money. So, Mr Masurubu felt that this was a huge success. According to him, it indicated that learners had learned something from school, which they practised in real life at home, therefore indicating success.

In addition, Mr Masurubu further emphasised that their school benefitted from recycling by exchanging papers, with one recycling company that supplied them with toilet paper, which for him was another success from using the strategy of recycling. For teachers such as Ms Loria, Ms Jua, Mr Itto and Mrs Atutu, apart from instilling environmental knowledge,

skills and values in learners, there were also other areas in which they had been successful. Mr Itto explained:

> *I feel that we have succeeded in many ways. Our school is now free from litter because learners have learned to use the rubbish bins to throw papers in; they have learned to save water and electricity; our vegetable gardens have produced veggies which supplement the feeding scheme of the school and we give vegetables to some vulnerable learners to take home; we have managed to control soil erosion by planting grass on our school compound; our nearby river is now not polluted by litter like it used to be and the community can fetch water from there for domestic use*.

All the teachers also indicated that through the Eco-Schools programme they learned what is called 'green business', through which they have been doing fundraising for their schools. They explained that green business is all about selling some of the vegetables produced from the school gardens to the local communities. In close relation to fundraising through green business, and apart from what was mentioned by Mr Masurubu above, other teachers, such as Ms Loria and Mrs Atutu, indicated that their schools benefited from recycling through selling the waste to recycling companies. This, according to them, was a success, as they raised funds for their schools to buy more resources for teaching and learning. Mrs Atutu further stated that some of the indigenous trees they planted in their school (photo 4.1 in section 4.2.4.1) were medicinal, which helped the local people to cure some minor illnesses. According to the teachers, all these were successes.

4.2.3.6 Challenges experienced while using strategies for teaching environmental content in iLembe District

The teachers were asked about their experiences in terms of challenges they faced while teaching EE. Teachers' responses regarding the challenges presented here concur with the concepts of concrete experience and abstract conceptualisation under the experiential learning theory (see Kolb 2015). All the teachers indicated that they indeed experienced challenges while implementing EE in their respective schools. Most of the teachers reported similar challenges, with some variations. For example, Mr Amoko, Mr Masurubu and Mr Itto reported challenges such as shortage of time and resources, heavy workloads as one teacher teaches more three subjects and large numbers of learners, mostly above forty in classes, which hinder classroom and outdoor strategies such as group discussion and field trips respectively. For Ms Loria and Ms Jua, the Covid-19 pandemic had been a particularly huge challenge, as it had disrupted the normal

functioning of teaching and learning activities in schools and limited schools from using other strategies. Ms Loria further explained:

> *One big challenge we have is this corona pandemic. It has really made things difficult for us. From the beginning of 2020 all the normal environmental activities we used to carry in our school stopped. We don't use outdoor strategies such as gardening and field trips anymore. Even our classrooms have been split into many grade divisions and with the on and off situation of lockdowns everything has been very challenging.*

Integration of EE with other subjects also posed challenges of confusion for some teachers, making it difficult for them to use successful strategies for teaching EE and as such there was a tendency from some teachers to ignore teaching the content of EE. They wished EE to be made a separate subject for the reason that integration created confusion to teach and assess the content of EE with other subjects. Mr Itto explained this by saying that integrating EE with other subject is challenging because it is confusing how to teach or even assess environmental content; suggesting that, if possible, EE should be made a separate subject so that all teachers would know the content to teach and assess.

Mr Itto further indicated that knowing that there were committees formed through membership to the Eco-Schools and SEEP programmes that were responsible for environmental activities in the respective primary schools, other teachers withdrew or neglected engaging in the participation of environmental activities in their schools, forgetting that EE is supposed to be the responsibility of all stakeholders of the school. This, according to him, made the work of the environmental committees very difficult because outdoor strategies such as school gardening and recycling need involvement of the entire teaching staff. Lack of participation from other teachers consequently hindered the implementation of EE in schools.

Lack of sufficient space and poor soil texture as well as shortage of water were also indicated as challenges with regards to practicing outdoor strategies such as planting of trees and vegetables. To teachers such as Mr Amoko and Mr Masurubu, inadequacy of space particularly negatively affected outdoor activities such as the celebration of Arbor Day and other fundraising activities related to the green business as such events require enough space. This consequently hampered the implementation of EE at the school. Mr Masurubu explained this as follows:

> *As our school is situated in a township, we have very limited space at our school and no school ground, which hampers outdoor strategies of planting trees and vegetables as well as fundraising activities like the green business. Many times*

we depend on the community ground for activities like Arbor Day celebrations and other activities. We even plant our vegetables in front of the classrooms because we do not have space for proper school gardens. Apart from that, soil at our school is not very good for growing vegetables and even other trees. We need a lot of water for watering, but sometimes we run out of water and our plants suffer.

4.2.4 Non-participant observations of school premises

Visits to the schools revealed that two of the three schools had been continuing with school gardening from the time Covid-19 started, while in one of the three schools there was no sign of recent school gardens or recycling activities. The following presentations with pictorial evidence and analysis indicate the data the researcher obtained from the non-participant observations. All the environmental activities or strategies presented below, which teachers from the three participating schools used for implementing EE, delineate the concept of active experimentation of the experiential learning theory of David Kolb (see Kolb 2015). It explains putting into action what learners have learned through feeling, watching and thinking under the constructs of concrete experience; reflective observation and abstract conceptualisation respectively (see Kolb 2015). It should be noted, however, that although a photo of a JoJo tank of only one school is shown, all the three schools had JoJo tanks for harvesting rainwater.

4.2.4.1 Visit to Abiria primary

Abiria primary was the first to be visited and the data indicated that practical environmental activities were evident in the school. The school had hired gardeners to carry on with the practical environmental activities, as learners were not allowed to participate in such activities from the start of the Covid-19 outbreak to ensure social distancing. The school premise appeared free from litter with the presence of litter bins at every corner; there were vegetable gardens, while flowers and trees, some of which were fruit trees, specifically papaya and mango, which were planted a few years ago, could be seen along the vegetable gardens in Photo 4.1 in the appendices.

Apart from the vegetable gardens, fruit trees and flowers, Abiria primary also had indigenous and medicinal trees such as aloes planted in a piece of land near the school gate as part of natural resource conservation. The trees were planted in the previous years during the Eco-Schools programme. These trees helped to provide medicines for the surrounding community. To access the medicinal trees, the community members

would make a request to the leadership of the Eco-Schools committee that is responsible for the environmental affairs of the school. The school also used these plants as teaching and learning support materials. Photos 4.2 below show these plants.

Photos 4.2: Indigenous and medicinal trees at School Abiria primary

4.2.4.2 Visit to Luge primary

Luge primary was the second to be visited. The researcher intended to establish evidence of practical environmental activities taking place in the school. Although the school appeared free from litter and there were litter bins present, there was no sign of recent recycling or activities of school gardening. There were, however, grown trees and flowers on the school premise, as seen in Photo 4.3 in the appendices, which were planted in the previous years before the outbreak of Covid-19 pandemic. This was in agreement with what the researcher established during the interviews, as Ms Jua indicated that since the outbreak of the Covid-19 pandemic last year, they had not been doing school gardening. The school decided to stop learners from participating in outdoor strategies such as gardening and recycling as it was deemed risky for learners in terms of infection, yet the school had not hired gardeners to continue with school gardening activities. The school's hygiene was managed by a few cleaners who were spotted at the school. The school had a JoJo tank, as seen in Photo 4.4 below, for harvesting rainwater, which played part as natural resource conservation and to ensure the continuity of the gardens which served as teaching resources.

Photo 4.4: A JoJo tank for harvesting rainwater at Luge primary

4.2.4.3 Visit to Celina primary

Celina primary was the third and last to be visited. The non-participant observation revealed that Celina primary was also free from litter and was green. The school had an active recycling project running as a strategy to manage waste from which it benefited significantly, as explained by Mr Masurubu during the interview. Although due to the Covid-19 pandemic learners had not been allowed to participate in the collection and sorting of waste for recycling, the researcher established that the school had hired cleaners and gardeners to do the work. Photo 4.5 shows the recycling bins where paper and plastic waste were sorted, which were collected by a recycling company in exchange for toilet paper.

Photo 4.5: Recycling activities at Celina primary

In addition, Celina primary also had active school gardening run by the gardeners of the school. There were vegetable gardens available, while there were also trees and flowers that were planted in the previous year before Covid-19 outbreak. The vegetables supplemented the school's feeding scheme, given to vulnerable learners and previously supported the green business initiative introduced by the Eco-Schools programme, while the trees and flowers promoted the greening and beautification of the school premise, as seen in Photo 4.6 in the appendices. There was, however, no evidence of medicinal plants or trees at Celina primary.

The researcher took notes during the non-participant observations of everything visible and available that related to the strategies for teaching and implementing EE in the three schools visited. These notes are summarised in Table 4.3 below.

Table 4.3: Summary of observations of the physical environment of the school premises

PHYSICAL ENVIRONMENT OF THE SCHOOL PREMISES	**ABIRIA PRIMARY**	**LUGE PRIMARY**	**CELINA PRIMARY**
Type of environment in which the schools are situated	Situated in a rural area	Situated on a farm	Situated in a township
Presence or absence of litter	Neat and clean premise; there were litter bins	Neat and clean premise; there were litter bins	Neat and clean premise; there were litter bins
Evidence of school gardening, e.g. planting of vegetables, trees and flowers	Vegetables were present in the gardens as well as trees and flowers	No vegetables in the gardens; there were trees and flowers from previous years	Vegetables were present in the gardens as well as trees and flowers
Presence of indigenous and medicinal trees and shrubs	There were indigenous and medicinal plants	No indigenous or medicinal plants available	No indigenous or medicinal plants available

Evidence of natural resource conservation	JoJo tanks available to harvest rainwater; grass planted to prevent soil erosion	JoJo tanks available to harvest rainwater; grass planted to prevent soil erosion	JoJo tanks available to harvest rainwater; no grass planted
Evidence of alternative sources of energy	No evidence of alternative energy source such as solar panels	No evidence of alternative energy source such as solar panels	No evidence of alternative energy source such as solar panels
Evidence of recycling activities	Recycling bags present	No recycling bins	Recycling bins present
Evidence of sufficient space to accommodate EE activities, e.g. green business or Arbor Day	Sufficient space: the assembly spot and the school ground	Sufficient space: the assembly spot and the school ground	Not sufficient space: no school ground; school depends on a distant community ground; vegetables planted in front of classrooms
Evidence of compost making	There was an evidence of compost making	No evidence of compost making	No evidence of compost making

4.2.5 Document analysis

The researcher's intention with the document analysis was to augment data from the interviews and observations so that the researcher could conduct the research based on rich data. The documents that were analysed included Eco-Schools as well as SEEP portfolios and audits, lesson plans and minutes of meetings in the participating schools that were members of the Eco-Schools programme, the CAPS documents as well as school-designed environmental policies.

4.2.5.1 Eco-Schools and SEEP portfolios

The researcher analysed two Eco-Schools portfolios from Luge primary and Celina primary, while teachers at Abiria primary could not locate their Eco-Schools portfolio, but

presented the researcher with a portfolio compiled from 2018 under the SEEP programme, which the researcher analysed.

- *Eco-Schools portfolios*

Luge primary and Celina primary formed Eco-Schools committees comprising a coordinator and an assistant, a member of the school management team, teachers and learners from grades 5 to 7. The number of committee members depended on the school: Luge primary had seven members, while Celina primary had ten. Although the number of committee members varied per school, they had a similar focus, as they all belonged to the same programme of Eco-Schools. The schools compiled their profiles and conducted the first Eco Audit, which included a whole-school review to identify environmental management needs and environmental learning opportunities for the schools. The schools later conducted a second audit to establish areas of success and improvement. The schools worked on five themes, namely Local and Global Issues, Resource Use, Nature and Biodiversity, Community and Heritage, and Healthy Living. Each theme had specific environmental activities on which the schools worked and these activities were linked with the curriculum as strategies for EE, which were indicated in the teachers' lesson plans. The schools were free to choose which of the five themes they started with and the records indicated that both Luge primary and Celina primary happened to start with Healthy Living as their first theme. This is probably because the schools considered growing vegetables and planting trees as a priority and part of the Healthy Living theme. Each year, the schools worked on one theme and since there were five themes, they worked for five years until all the themes were exhausted. The Eco-Schools committees conducted meetings with minutes filed in the portfolios and formulated action plans at the beginning of every year to guide the environmental activities, such as preparation of land, planting of vegetables and trees as well as recycling at the schools throughout the year. The schools had an Eco Code that acted as an environmental policy that guided the activities of the schools. The committees spearheaded all the environmental activities at the schools and compiled the Eco-Schools portfolio during the five-year period. During the five-year period, these schools had received the Bronze, Silver and Gold awards, including the Green Flag for their successes in promoting whole-school development through EE.

- *SEEP portfolio*

The SEEP portfolio is not much different from the Eco-Schools portfolio. School A joined SEEP after the Eco-Schools project ended with the schools in iLembe District in 2017. SEEP carried on with similar activities that were done through the Eco-Schools programme. They established a committee in the form of an environmental club consisting

of 30 members, including teachers and learners. They conducted audits and developed an environmental policy that promoted both indoor and outdoor strategies of EE concerning cleaning and greening the school as well as linking EE with the curriculum. The school had compiled a portfolio for their activities and the SEEP programme was still on-going at the time of this study.

4.2.5.2 Teachers' files

The researcher analysed teachers' files with the intension to establish whether or not teachers were integrating EE into their lessons, the kind of strategies used and how teachers assessed environmental content. Teachers' files, especially for languages, Life Skills, Natural Sciences and Technology, and Grade 6 Social Sciences, indicated lesson plans that portrayed integration of EE into the subjects and the assessment question papers for these subjects indicated the assessment of EE content. However, the Grade 6 teachers**,** Mrs Atutu and Mr Masurubu, who previously also taught other subjects, taught only Mathematics at the time of the study and as such, the researcher could not find evidence of integration and assessment of EE content into the planning and assessment records in their files.

4.2.5.3 CAPS

The researcher analysed the files of teachers who taught Mathematics, languages, Life Skills, Natural Sciences and Technology, and Social Sciences. The CAPS documents for all these subjects advocated for integration and promotion of EE with the respective subjects. This is clearly indicated in the general as well as the specific aims of all the subjects.

4.2.5.4 Environmental policies

The CAPS documents for all the subjects have a clear environmental policy that has infused the principles and practices of environmental justice and human rights as clearly defined in the Constitution of the Republic of South Africa. In addition, the Eco Codes in the Eco-Schools portfolios in Luge primary and Celina primary and the school environmental policy designed by Abiria primary under the SEEP programme were also part of policies that guided the schools to promote the integration of EE into the subjects and the outdoor environmental activities that the schools conducted.

4.2.5.5 Photos

In all three schools, the researcher found records of environmental activities in which the schools have been engaging from photos found in the Eco-Schools portfolios, the SEEP portfolio as well as pasted on the walls of the offices of the schools. All these indicated

the indoor and outdoor strategies the schools had been using, such as making posters, vegetable planting and harvesting, tree and flower planting as well as field trips. Table 4.4 shows a summary of the information gathered during the document analysis.

Table 4.4: Summary of data gathered during document analysis

DATA FROM DOCUMENT ANALYSIS	ABIRIA PRIMARY	LUGE PRIMARY	CELINA PRIMARY
Eco-Schools and SEEP portfolios	SEEP portfolio contained evidence of EE policy and activities	Eco-Schools portfolio contained Eco Code and evidence of EE activities	Eco-Schools portfolio contained Eco Code and evidence of activities
Teachers' files	Lesson plans and assessment records indicated integration and implementation of EE	Lesson plans and assessment records indicated integration and implementation of EE	Lesson plans and assessment records indicated integration and implementation of EE
CAPS documents	Available and advocated for integration and promotion of EE activities	Available and advocated for integration and promotion of EE activities	Available and advocated for integration and promotion of EE activities
Other environmental policies	School-designed policy for promoting EE activities under SEEP	Eco Code promoting EE activities; no other policies present	Eco Code promoting EE activities; no other policies present
Photos (refer to photo 4.7 in the appendices as an example)	Evidence of indoor and outdoor EE activities pasted on walls	Evidence of indoor and outdoor EE activities pasted on walls	Evidence of indoor and outdoor EE activities pasted on walls

4.3 DISCUSSION OF FINDINGS

This section presents a discussion of the findings based on an interpretation and meaning making of the empirical data that were presented and analysed in Section 4.2 above in comparison with the theoretical knowledge gathered through the literature review. The findings are discussed with reference to the aims of the research so as to address the research question for this study. The findings revealed both positive and negative factors teachers experienced in the course of implementing EE in primary schools, ranging from individual perspectives of teachers towards EE to logistical as well as contextual factors relating to the location of schools and the curriculum. The data interpreted were categorised under the themes of strategies for implementing EE, both classroom and outdoor; policies that influence the implementation of EE in primary schools; support from programmes, projects and NGOs for implementing EE in primary schools; the physical location of the schools as a contextual factor in the implementation of EE; and successes and challenges experienced by teachers as they implemented EE in primary schools. These are discussed below.

4.3.1 Classroom and outdoor strategies teachers use for implementing environmental education

The empirical data from the interviews and document analysis for this study revealed that teachers employed a number of strategies for teaching EE in primary schools in iLembe District. These include both classroom and outdoor strategies, which are discussed in relation to the scholarly findings from the literature for this study below.

4.3.1.1 Classroom strategies for implementing environmental education in primary schools

In the literature, a number of classroom strategies were discussed as stated by different scholars in different contexts at international, regional and local levels. Such classroom strategies include giving group projects to make things out of waste, group work and demonstrations, investigations, role plays, lectures and question and answer sessions, debates, essay writing and presenting, designing posters, showing pictures and videos and Upcycler's Lab board games used for teaching EE (Aditi 2018; Faragallah 2016; Hebe 2019; Kalorth & Sreekumar 2015; Kimaro 2018; Mawela 2020). Scholars such as Mawela (2020) and Hebe (2019) argue that these strategies work tremendously well and in different ways in instilling environmental knowledge, skills and values in learners and developing language and cognitive skills as well as skills of fine arts, a spirit of teamwork and leadership, among others. For Kimaro (2018), such classroom strategies instil in learners analytical, cooperative and research skills that are necessary for solving environmental problems in real life. Although the data from the respondents in this study concurred to a great extent with the theoretical findings of the literature review, strategies

such as investigations, lectures and question and answer sessions were however not mentioned by any of the respondents, which is therefore an indication that more strategies need to be used. In addition, the strategy of Upcycler's Lab board games of Aditi (2018) has only been uniquely used in India, which scholars from other countries in the literature as well as the respondents of this study had no idea about, which indicates that there are other efficient strategies out there for implementing EE that many teachers are not aware of, therefore paving the way for further discovery.

4.3.1.2 Outdoor strategies for implementing environmental education in primary schools

Several outdoor strategies were indicated by scholars in Chapter 2 as efficient in implementing EE in primary schools. Such strategies include field trips, tree planting in conjunction with Arbor Day celebrations, establishing vegetable gardens and litter-free campaigns of picking up and sorting out waste materials for recycling (Kalorth & Sreekumar 2015; Matsekoleng 2017; Mawela 2020). According to Matsekoleng (2017) and Mawela (2020), such strategies engage learners in the practical activities of cleaning and greening schools. Outdoor strategies are crucial and perhaps more vital than classroom strategies for the implementation of EE for the reason that they encourage learners to actively engage with the physical environment and learn from it with practical experience. This is in line with the experiential learning theory of David Kolb (Kolb 2015), which argues that learning through experiences, for instance with outdoor strategies, exposes and encourages learners to be in direct contact with the reality being learned, unlike the learner who hears or reads about the reality, supposedly through classroom strategies. According to Kolb (2015), the learner who learns through experience translates the experience into authentic knowledge that stays with the learner.

The data from the respondents in this study showed to a large extent concurrence with the data in the literature in terms of the outdoor strategies used for implementing EE in primary schools. However, a disagreeing factor surfaced, as one outdoor strategy, namely beach and river cleaning, indicated by one of the respondents during the interviews, did not appear anywhere in the literature. In addition, although water-saving skills as a strategy was indicated by one of the respondents, it did not explicitly include checking and fixing leaking taps, as explained by Mawela (2020), which therefore indicates that the issue of water conservation is not as properly addressed in these participating schools as it should be. It should be noted that an enormous amount of water can be wasted if taps are not regularly checked for leaks and fixed. As stated by Donnenfeld et al. (2018), South Africa is a water-scarce country, and therefore such strategies of water conservation should be employed by primary school teachers to strongly instil the necessary knowledge and skills in learners that they can use in real life. Furthermore, the use of

indigenous and medicinal trees as part of teaching resources with outdoor strategies for teaching EE was mentioned by one of the respondents in this study. This is also a strategy that is linked with the CAPS, as it is integrated into Grade 6 Social Sciences as indigenous knowledge, which needs to be instilled in learners. However, this strategy did not appear in the findings of the literature for this study.

4.3.2 Policies that influence the implementation of environmental education in primary schools

Effective and supportive policies are crucial for the implementation of EE. In the literature review, Almeida et al. (2018) indicate that from as early as 2010, the implementation of EE in Australian primary schools improved as a result of a supportive policy by the Australian national curriculum authority. According to Almeida et al. (2018), this policy emphasises accommodating EE in all subjects, which acts as a strategic plan that enables teachers to successfully use strategies such as field trips and recycling for implementing EE. This is very much in line with the history of the development of EE in South Africa when national curriculum policies such as EEPI and EECI strongly advocated for the implementation of EE in South Africa (Munasi 2019; Zwelibanzi 2016). According to Munasi (2019), EECI played a key role in the development of the RNCS from curriculum 2005, consequently ensuring the integration of EE as a cross-curricular discipline in the South African curriculum framework for the GET band. However, these policies did not work in isolation, but in collaboration with environmental Acts such as NEMA, among many others, in conjunction with the White Paper on Education and Training and the Bill of Rights, which have strongly supported the integration of EE (Beech et al. 2017; DoBE 1995). Similarly, data from this study agreed with the theoretical data, as the CAPS documents found at the participating schools stressed the integration of EE into all subjects. Furthermore, the Eco Code in the Eco-Schools portfolios as well as the environmental policy in the SEEP portfolio all supported the integration and implementation of EE, which is an indication that these primary schools followed supporting and guiding policies for the implementation of EE.

4.3.3 Support from programmes, projects organisations for implementing environmental education in primary schools

The literature revealed programmes that were used to implement EE at international, regional and local levels, for example the programmes DPEP and SEED that aided the integration and implementation of EE in the Indian school curriculum (Kalorth & Sreekumar 2015). According to Kalorth and Sreekumar (2015), DPEP and SEED are classroom and nature-oriented strategies that brought awareness of EE from the classrooms to the public, making learning more effective and rendering quality education

at the primary school level. Literature also revealed that Eco-Schools as well as SAGSP are some of the environmental programmes operating in South Africa. Eco-Schools is run by WESSA country-wide, while SAGSP was introduced and run only in the Limpopo province (DEA 2019; WESSA 2020). These programmes aimed at bringing awareness of environmental sustainability to schools and their surrounding communities, providing resources and assisting schools by linking EE activities such as recycling and school gardening with the curriculum with practical environmental activities, equipping them with the skills of solving environmental problems such as pollution and water crises (DEA 2019; WESSA 2020).

Similarly, data from the interviews with the respondents and document analysis for this study also revealed that programmes such as Eco-Schools and SEEP had been helping the schools in terms implementation of EE. Although only one of the three schools indicated to be an affiliate of the SEEP programme, all three participating schools used to be active members of Eco-Schools. Consistent with the literature, these programmes had strongly assisted the primary schools in terms of the implementation of EE.

Closely related to the programmes discussed above are projects that also played a key role in assisting schools to implement EE. As discussed in Chapter 2, literature revealed projects such as the Green Corner, which is run by an environmentally concerned society in conjunction with the Ministry of State for Environmental Affairs and the Egyptian Environmental Affair Agency, as well as a South African-based project known as SAEP, which originated from the townships of Cape Town, Western Cape, founded in 1994, to be assisting in the implementation of EE (Faragallah 2016; SAEP 2021). According to Fragallah (2016), Green Corner has engaged with schools to help as a strategy to provide environmental literacy and awareness to learners in primary schools, which is the same assistance provided by SAEP to the primary schools in Cape Town (SAEP 2021). However, the empirical data for this study did not indicate any of the participating schools getting assistance from a project, which therefore means that some of these schools were not getting enough support given the fact that Eco-Schools had stopped with its programmes of assisting schools.

However, data from the respondents revealed that a local NGO, known as Umhlali Country Club, supported one of the participating schools, which was also a member of the SEEP programme. Such a school is in a better position to develop environmentally, as it receives more support in terms of resources and strategies for implementing EE. Similarly, as discussed in Chapter 2, data from the literature indicated that a number of NGOs were said to be helping schools. For instance, in Tanzania, McCrohan (2017) indicated the establishment of non-profit organisations known as Twende Pamoja and

Kesho Trust, which work in partnership with Saving Africa's Nature. McCrohan (2017) argued that these NGOs assisted primary schools to implement EE through practical strategies such as tree planting as well as recycling. In South Africa, organisations such as EEASA and SANBI, among others, were indicated in the literature to be instrumental in the implementation of EE in primary schools (DFFE 2019; Mawela 2020). It therefore means that schools that are affiliated with a number of NGOs as well as programmes and projects have an upper hand to promote the implementation of EE. It should however be noted that some of these NGOs and programmes, such as EEASA and Eco-Schools, were no longer active in some parts in South Africa at the time of this study, but the schools that were once affiliated with them were expected to continue with the strategies they had learned.

4.3.4 Physical location of the schools as a contextual factor in the implementation of environmental education

The physical location of a school is a significant contextual factor that either positively or negatively affects environmental activities of the school. As indicated in chapters 1 and 3, the researcher chose three schools to participate in this study, all situated in different locations, namely rural, farm and township, which had different environmental backgrounds in terms of topography and availability of enough space. For instance one of the respondents from the rural school indicated that their school is located on a sloppy land which posed a challenge of soil erosion. Data from the interviews with the respondents and non-participant observations for this study also revealed that one of the three schools, which was situated in a township, did not have adequate space for outdoor environmental activities such as vegetable gardening, celebration of Arbor Day and green business for fundraising. In comparison, the rural and farm schools had considerably more space for gardening and school grounds for outdoor environmental activities than the township school, thereby enabling easy implementation of EE.

Data from the literature also confirmed that space was indeed a crucial contextual factor. The study of Sousa et al. (2017) conducted in some South African farm, township and urban primary schools of the Gauteng and North West provinces confirmed this by stating that farm schools have an advantage over urban or township schools for the reason that they are situated in the resourceful vicinities of open land with sufficient space and substantial natural resources. Sousa et al. (2017) argue that sufficient space with natural resources encourage the education *in* or *through* the environment dimension, as such natural resources, for instance land, vegetation, animals and rivers, play a significant role in teaching and learning EE. Teachers use strategies such as field trips, tree planting and establishing vegetable gardens to expose learners to such natural resources, which

makes learning in EE exciting (Sousa et al. 2017), as compared to the education *about* the environment dimension (Munasi 2019), which basically concerns classroom strategies that remain dominant in township schools. It therefore implies that for schools to function well environmentally, sufficient space is paramount. Sousa et al. (2017) further argue that rural and farm primary schools have another advantage over urban or township schools due to a low rate of solid waste pollution, compared to the urban or township schools, where there is a high rate of solid waste pollution.

4.3.5 Successes in the implementation of environmental education in primary schools

The sole idea of integrating EE into the school curriculum and implementing it is to ensure that schools succeed in imparting the necessary knowledge, skills and values in learners, who will then protect and improve the environment, thereby achieving the goals of EE (UNESCO 1977). This was confirmed in Chapter 2, as literature revealed that teachers in primary schools internationally, regionally and locally were successful in using strategies in a number of ways. For instance, scholars such as Sousa et al. (2017), Kimaro (2018) and Mawela (2020) all indicate that teachers were successful in using classroom strategies such as group discussions, debates, essay writing, projects, investigations, role plays, designing posters, presentations and demonstrations for implementing EE in primary schools. Sousa et al. (2017) argue that such strategies have instilled in learners the necessary environmental knowledge, skills and values, while Kimaro (2018) and Mawela (2020) further assert that such strategies have equipped learners with analytical, cooperative, communication and water conservation skills that they use to solve problems in real life.

Similarly, data from the respondents in this study confirmed that teachers were successful in instilling aforementioned environmental knowledge, skills and values in learners, which they practised in real life. In this regard, Matsekoleng (2017) indicates that teachers in primary schools were successful in using field trips as a strategy, through which learners acquire the necessary knowledge, skills and values when they are exposed to nature and an information-rich environment. In this case, learners experience nature practically in the physical environment and learn from it, which is an idea backed by the experiential learning theory of David Kolb (2015) to be a better way of learning EE. In addition, as indicated in Chapter 2, teachers have also been successful in using outdoor strategies such as planting trees and vegetable gardens and recycling in primary schools (Mawela 2020; Treagust et al. 2016). These authors argue that such activities have resulted in schools being cleaned and greened, earning the schools some money as well. It was confirmed by the data from the interviews, non-participant observation and document

analysis for this study that such outdoor strategies indeed have aided in the implementation of EE, not only in the schools, but also in the surrounding communities. This is because one of the respondents indicated that learners from their school had reported having a vegetable garden established at home, planting trees and their families participating in recycling activities, thereby keeping their environment clean and green and earning some money. This means success realised from using such strategies.

However, a unique fundraising activity known as green business, which entails selling vegetables produced from the school gardens and which was introduced by the Eco-Schools programme, was mentioned by the respondents in this study, which did not surface in the literature. This therefore means that it is an activity from which the rest of the schools that have not been members of the Eco-Schools programme can learn.

Success in the realisation of a clean and green school environment has also been mentioned in the literature to be encouraged by programmes such as SEED and Green Corner (Faragallah 2016; Kalorth & Sreekumar 2015). According to these scholars, schools that participated in such environmental programmes successfully used strategies such as recycling and planting trees and vegetables, which resulted in a clean and green environment as well as creating environmental awareness. It was confirmed by the data from this study that programmes such as Eco-Schools and SEEP had greatly assisted primary schools to realise a clean and green environment as seen in photo 4.3 in the appendices. It should, however, be noted that due to the Covid-19 pandemic, some schools had ceased from engaging in such outdoor strategies to prevent learners and teachers from being infected.

4.3.6 Challenges teachers experience in the course of implementing environmental education in the primary schools

As discussed in the literature review in Chapter 2 and section 4.3.2 of this chapter, the governments of Australia and South Africa had developed strategic and effective environmental policies that support and promote the integration and implementation of EE in schools (Almeida et al. 2018; Munasi 2019; Zwelibanzi 2016). However, it is a different case in Egypt. According to Faragallah (2016), Egyptian environmental policies failed to effectuate the country's action plans for protecting the environment and shaping human behaviour towards the environment. This, according to him, challenged the implementation of EE, thereby resulting in poor development of EE in primary schools in Egypt. Compared to the empirical data for this study, poor environmental policy did not surface as a challenge.

It is agreed that the implementation of EE can be challenging given the existence of different negative factors that are contextually comprehensible. Hebe (2019) and Mawela (2020) mention a number of these negative factors, which include logistical barriers, time constraints due to heavy workloads and inadequate funding and resources. While the aforementioned inadequacy of time and resources prevent teachers from engaging in environmental activities such as field trips and recycling, according to Hebe (2020), misconceptions about EE and who should teach it are yet more challenges to teachers. Mawela (2020), McCrohan (2017) and Maluleke (2015) further indicate that teachers in primary schools are working under pressure in overcrowded classrooms, and as such they view EE as an extra burden. According to them, overcrowded classrooms prevent teachers from using classrooms strategies such as group discussions or group projects, and as a result of heavy workloads, teachers tend to neglect teaching the content of EE with the view of concentrating on the content of the subjects that, according to them, are more important. Data from the participants of this study vividly concur with the claims of these scholars on the challenges of the aforementioned factors hindering the implementation of EE, while other participants were of the opinion that, given the possibility, EE should be made a separate subject due to the challenges they faced while trying to integrate EE with other subjects. As in the South African context, with the CAPS position being very clear about integration and implementation of EE, such claims from the participants require further investigation.

In the literature, as discussed in Chapter 2, scholars such as Faragallah (2016), Kimaro (2018) and Mawela (2020) all indicate a lack of environmental expertise to be another challenging factor that hinders the implementation of EE in primary schools, especially in Egyptian, Tanzanian and South African contexts. They argue that, among other things, insufficient environmental expertise leads to misconception of EE content by teachers and therefore failure to choose suitable strategies for teaching EE. However, the participants in this study did not mention a lack of environmental expertise as a challenge to them, even though some of them mentioned challenges related to the integration of EE with other subjects. This is probably because they felt they had learned much from environmental programmes such as Eco-Schools and SEEP. However, the document analysis conducted by the researcher revealed that there was neither evidence of integration of EE nor was there evidence of assessing EE in the assessment records, especially in the files of the Mathematics teachers. This clearly indicated that the teachers, more especially the Mathematics teachers, were actually experiencing challenges in terms of integration and assessment of EE content, which ultimately points to inadequacy of environmental expertise among the teachers.

Nevertheless, according to Ismail (2017), the challenge in teaching EE does not only emanate from teachers' lack of environmental expertise or other logistical barriers such as lack of teaching and learning support materials and funding, but also from learners' poor attitudes towards EE as another challenging factor that inhibits teachers' success in both classroom and outdoor strategies such as designing posters and excursions. Ismail (2017) argues that most of the learners are reluctant about the contents of EE, as they and their teachers consider it secondary to their learning. This was echoed by Treagust et al. (2016) and Matsekoleng (2017), stating that learners' attitudes towards the environment remain very poor, with an exception that girls show a little more dedication and commitment to environmental affairs. However, according to Treagust et al. (2016) and Matsekoleng (2017), issues such as littering are a big challenge in many primary schools both internationally and locally. This challenge is reiterated by Mapotse and Mashiloane (2017), stating that littering is one of the major environmental problems in several primary schools in South Africa because many schools are littered and this is a challenge to the progress of EE as well as degrading the physical environment. On the contrary, however, the data from the interviews and non-participant observations for this study indicated that the three schools were clean, green and free from litter and that learners' attitudes towards the environment were positive.

Support, cooperation and effective communication are vital for proper functioning at any level or setting, and more especially in schools. However, as discussed in Chapter 2, Mawela (2020) and Sousa et al. (2017) indicate that the implementation of EE in some primary schools suffers due to a lack of enough support from school stakeholders, consequently leading to insufficient funding to obtain teaching and learning support materials to support field trips and school gardening. They argue that this lack of support from stakeholders is linked with poor communication among stakeholders. In agreement with this, data from the respondents in this study indicated a lack of cooperation from other educators as a challenge in terms of implementing EE. One teacher stated that even though they try to bring it to the attention of the teachers that the implementation of EE is a responsibility of every stakeholder, knowing that there are committees formed through membership with the Eco-Schools and SEEP programmes to spearhead environmental activities in the respective primary schools, other teachers withdraw or neglect engaging in environmental activities in their schools.

In India, poor connectivity was indicated by Aditi (2018) as a challenge to rural schools while trying to use technology as part of teaching and learning strategies in EE. She argues that this is due to poor technological development in the remote areas of India, resulting in poor network coverage for phoning, for instance while organising excursions

and using the internet for online teaching and learning support materials. However, this did not surface as a challenge to the participating schools in this study. Nevertheless, lack of sufficient space and poor soil texture as well as a shortage of water were indicated as challenges in some of the participating schools, with the issue of insufficient space being linked specifically with one of the three schools located in a township. According to the respondents, inadequacy of space negatively affects outdoor activities such as the celebration of Arbor Day and the planting of vegetables, trees and flowers. This consequently hampers the implementation of EE at the schools. The issue of insufficient space for outdoor activities did not surface as a challenge in the literature.

The respondents in this study stated that they had been faced with one big challenge, namely the Covid-19 pandemic as highlighted in section 4.2.3.6 above. Despite the fact that schools had hired gardeners to carry on with the work of recycling and school gardening, learners were missing out, as they were not exposed to the physical environment as they were used to anymore, and this therefore hindered the implementation of EE. This was never mentioned in the literature, which is understandable, as Covid-19 is a current pandemic.

4.4 SUMMARY

This chapter entailed the data presentation, analysis and interpretation for this study. The chapter was introduced and the steps taken in the process of data collection were described. This started with the identification of the participating schools and sampling of the teachers from the participating schools, development of the data collection instruments, application to various parties for ethical clearance and permission to conduct the research, followed by visiting the schools for data collection. After the description of the data collection process, the data collected through one-on-one interviews, non-participant observations and document analysis were presented together with the data analysis, which was then followed by a discussion of the findings.

In the last chapter, the summary, conclusions and recommendations for this study are presented. This is accompanied with the discussions and indication of the avenues for further research, the limitations of the study as well as concluding remarks.

CHAPTER 5: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

As indicated in Chapter 1, the aim of the study was to explore how teachers use strategies to teach EE in primary schools in iLembe District, with the following objectives:

- To describe the strategies used by primary school teachers to implement EE in primary schools in iLembe District
- To investigate how successful teachers are and the challenges they face while using strategies to implement EE in primary schools in iLembe District.
- To explain how beneficial it is to teachers to partner with environmental programmes for implementing EE in primary schools in iLembe District.

This aim and the objectives provided guidelines for the researcher in terms of the kind of data to gather both theoretically and empirically.

In Chapter 2, an extensive literature review was conducted to gather information, knowledge and contributions of other scholars in the same field in the selected countries at international and regional levels as well as at national level. Thereafter, empirical research was conducted in the selected schools, where the sampled participants were engaged to collect data following directives and instruments that were stated and discussed in chapters 1 and 3. The collected data were presented, analysed and interpreted in Chapter 4.

This chapter encompasses the summary, conclusion and recommendations of this study. The summary presents the empirical findings of this study in reference to the scholarly findings. The conclusions are provided in the form of answers to the research questions that were stated in Chapter 1. Recommendations are made to suggest what should be done at various levels to ensure the successful implementation of EE in primary schools.

The summary of the empirical research findings therefore follows below.

5.2 SUMMARY OF RESEARCH FINDINGS

In this section, a summary of the empirical findings is given. The data concerned the experiences of teachers in terms of the successes and challenges they met regarding the strategies they use for teaching EE. Below follows a summary of the key empirical findings.

5.2.1 Key empirical findings

Empirical research was conducted by engaging with respondents through in-depth one-on-one interviews as well as through non-participant observations and document analysis, as discussed in Chapter 4.

5.2.1.1 Summary of in-depth one-on-one interviews

The findings from the interviews are summarised under the themes of successes in using classroom and outdoor strategies, types of resources used by teachers, conservation of natural resources and the factors that challenge teachers in the course of implementing EE in primary schools in iLembe District, as discussed below.

5.2.1.1.1 Classroom and outdoor strategies: Successes

The findings of this study revealed that teachers in the primary schools in iLembe District successfully used several classroom and outdoor strategies for implementing EE. The classroom strategies included designing posters; role plays; using pictures from newspapers or magazines; showing learners videos about the effect of littering; essay writing, especially in languages; and networking with other schools. Through these strategies, learners had acquired environmental knowledge, skills and positive attitudes, which they used in real life. This agrees with the scholarly findings discussed in Chapter 2, where literature indicated the success of teachers in the use of classroom strategies at international, regional and national levels.

The results of this study indicated that all the teachers in the participating schools in iLembe District also used outdoor strategies for implementing EE in their schools. Such strategies included field trips, beach and river cleaning, picking up litter, recycling waste materials, checking and fixing leaking taps, vegetable gardening, removing alien plants, and planting trees and flowers as supported by the experiential learning theory of David Kolb under the concept of active experimentation (see Kolb 2015), where learners were actively involved in practical work in the field. Schools benefited greatly from such strategies, for instance fundraising through recycling and the sale of vegetables, schools' feeding schemes being supplemented by vegetables, schools being cleaned and greened through litter picking and tree planting and saving water by checking and fixing leaks. This again is very much in line with what was revealed in the literature in Chapter 2, namely that primary schools successfully used outdoor strategies at all levels to implement EE.

5.2.1.1.2 Resources used to teach environmental education in primary schools in iLembe District

All the teachers in the participating primary schools for this study indicated using resources such as textbooks, charts, magazines, newspapers, worksheets and posters that have environmental information, computers and projectors to show videos when they explain environmental content to learners in the classrooms in their respective grades. In addition, the gardens, garden tools as well as the trees and medicinal plants also functioned as resources that the teachers used for teaching EE, and their learners learned from such resources with positive experiences.

5.2.1.1.3 Strategies to conserve natural resources at schools in iLembe District

The natural resources the teachers indicated to be conserving included water, energy, soil and trees as well as flowers. The results of this study confirmed that all the schools have JoJo tanks to harvest rainwater and they save electricity by switching off lights. Leaking taps were checked and fixed and before the Covid-19 pandemic, some of the schools had buckets of water at the door of each classroom for learners to drink from and tippy taps were used for learners to wash their hands to save water. The point of water conservation was particularly emphasised in Chapter 2, as water is a scarce natural resource in South Africa. The teachers also indicated removing alien trees and planting indigenous trees and flowers, some of which are medicinal, for conservation at schools, while in some of the participating schools, teachers planted grass to save the land from erosion. All these are part of the conservation of natural resources.

5.2.1.1.4 Factors that challenged teachers while using strategies for implementing environmental education in primary schools in iLembe District

All the teachers indicated facing challenges in their respective schools in iLembe District in the course of implementing EE. All of them mentioned challenges related to inadequacy of time and resources, heavy workloads and large numbers of learners in their classes, which are a hindrance especially to outdoor strategies such as field trips, school gardening and recycling among others. Teachers also raised an issue of confusion about how to teach or even assess environmental content, leading to some teachers developing the tendency of ignoring teaching the content of EE, all of which hinder the use of successful strategies for implementing EE.

Meanwhile, other teachers had withdrawn or neglected engaging in strategies such as tree planting and school gardening in their schools, all of which had hampered the implementation of EE. In addition, a lack of sufficient space, especially in the township school, and poor soil texture as well as a shortage of water were also indicated as challenges negatively affecting outdoor activities such as celebration of Arbor Day and planting of vegetables, trees and flowers. The Covid-19 pandemic was indicated as a

huge challenge, as it had disrupted the normal functioning of teaching and learning activities in schools, consequently limiting schools from using strategies such as gardening and field trips. Most of the challenges summarised here also surfaced in the scholarly review discussed in Chapter 2, except the challenge related to the outbreak of Covid-19, which is a current pandemic.

5.2.1.2 Non-participant observations in the participating schools in iLembe District

Non-participant observations were conducted in order to gather more data to supplement the data from the interviews. The findings relating to the presence of litter, the location of the schools and the availability of sufficient space, the availability of gardens, the presence of indigenous and medicinal trees, evidence of natural resource conservation and recycling activities are discussed below.

5.2.1.2.1 Presence of litter in the school

All three schools were clean and free from litter. Litter bins were present in all three schools for learners to throw litter in when they eat during break time. This showed that the schools took issues of hygiene seriously. One more factor in terms of being litter-free is that the schools were actively involved in recycling activities, with the exception of School B, which showed no recent involvement due to the Covid-19 pandemic, as discussed in Chapter 4.

5.2.1.2.2 Location of the schools and availability of sufficient space

Issues pertaining to the location of schools and space were discussed in chapters 3 and 4. The results showed that two of the three participating primary schools, namely the rural and farm schools had sufficient space, while the third, which was a township school, did not have sufficient space. This therefore indicates that farm and rural schools have an advantage of having sufficient space to conduct outdoor environmental activities over township schools with limited space.

5.2.1.2.3 Availability of school gardens, including trees and flowers

Two of the three schools had vegetables in their gardens as well as trees and flowers, while the third school did not have vegetables, but there were trees and flowers planted in the previous years. It was noticed that the other two schools had hired gardeners to continue with school gardening during the Covid-19 pandemic, while the third school did not, therefore no school gardening activities took place at the time of the study.

5.2.1.2.4 Presence of indigenous and medicinal trees

Indigenous knowledge is very important for EE and the presence of indigenous and medicinal plants at schools is crucial in this regard. However, as discussed in Chapter 4, the results indicated that only one of the three schools had indigenous and medicinal trees. This is an indication that the other schools were missing out on the opportunity of using indigenous trees as resources to teach their learners as well as the benefits of such trees as medicine and their value to the school environment.

5.2.1.2.5 Evidence of natural resource conservation

Issues regarding the conservation of natural resources such as water, indigenous plants and soil were discussed in chapters 2 and 4. In this regard, the findings from the non-participant observation indicated that JoJo tanks were available in all three schools to harvest rainwater. This means that the schools regarded the water crisis as a serious matter to deal with. It was noticed that in two of the three schools, grass was planted to prevent soil from being washed off by erosion, while the third school had none, which is an indication that the school did not take conservation of land seriously.

5.2.1.2.6 Recycling activities

All three schools were previously involved in recycling activities. However, it was noticed that only two of the three schools were actively participating in such activities at the time of this study, while the third school stopped due to the Covid-19 pandemic, as also discussed in Chapter 4. The presence of hired gardeners was noticed on the premises of two schools, while in the third school gardeners were absent, which therefore means that the third school did not endeavour to hire gardeners to continue the work of recycling.

5.2.1.3 Findings from document analysis in the participating schools in iLembe District

Documents that were deemed essential were analysed to collect data. Such documents included Eco-Schools and SEEP portfolios, teachers' files, CAPS documents, other environmental policies as well as photos, as discussed below.

5.2.1.3.1 Portfolios

As discussed in chapters 3 and 4, all three primary schools were once active members of the Eco-Schools programme until the programme stopped its engagement with the schools in 2017. However, the results revealed that one of the three schools joined the SEEP programme after the departure of Eco-Schools. Eco-Schools helped the schools to establish Eco-Schools committees of approximately eight to twelve members who spearheaded the environmental activities at the schools, while SEEP helped the schools to establish an environmental club of 30 members. The programmes supported the schools with the provision of workshops to train teachers, resources and strategies, as

discussed in chapters 2 and 4. The portfolios' content was in line with the discussions in Chapter 4. From all indications, it is clear that the schools benefitted considerably from the programmes in terms of aiding in the implementation of EE.

5.2.1.3.2 Teachers' files

The files of four of the six teachers contained records of planning and assessments showing integration of EE with other subjects such as languages, Life Skills and Social Sciences. However, the files of the two Mathematics teachers did not contain records of planning and assessments indicating integration of EE with Mathematics. This is an indication that the Mathematics teachers were among other teachers who faced the challenge of confusion with regard to integrating EE with their subjects and how to teach and assess the content.

5.2.1.3.3 CAPS documents

In relation to the discussion in chapters 2 and 4, all three participating schools had CAPS documents, which were also present in the teachers' files. The CAPS documents advocated for and provided directives on the integration and implementation of EE.

5.2.1.3.4 Other environmental policies

The schools had no other school-designed environmental policies apart from the CAPS and the Eco Code and environmental policy designed under SEEP, as discussed in chapters 2 and 4. This possibly indicates that before becoming members of such programmes, the schools did not take matters with regard to EE seriously or their EE activities were not guided by written policies. It could also be that even if there were previously written policies, they were lost as the researcher found no records of such.

5.2.1.3.5 Photos

Photos were available in the portfolios found at the schools, while others were pasted on the walls in the staffrooms, boardrooms and other offices. They all portrayed the engagement of the schools in the environmental activities through both indoor and outdoor strategies.

5.3 RESEARCH CONCLUSIONS

This section entails the conclusions for the study. The initial research questions that were stated in Chapter 1 are restated here and answers to them are provided. These answers stand as the conclusions for this research.

- *What strategies do primary school teachers use to teach EE in primary schools in iLembe District?*

The strategies that teachers in primary schools in iLembe District used were both classroom and outdoor strategies. The classroom strategies included designing posters, role plays, using pictures from newspapers or magazines, showing learners videos, essay writing and networking with other schools. The outdoor strategies included field trips, beach and river cleaning, picking up litter, recycling waste materials, checking and fixing leaking taps, vegetable gardening, removing alien plants and planting trees and flowers.

- What are teachers' experiences in using strategies when teaching EE in primary schools in iLembe district?

The experiences of teachers are explained in terms of successes and challenges they met while implementing EE in primary schools in iLembe District. To a large extent, the results discussed in Chapter 4 revealed that teachers in the primary schools in iLembe District were successful in using both classroom and outdoor strategies to implement EE in their schools. Through classroom strategies such as designing posters, role plays, debates and group discussions, learners had acquired environmental knowledge, skills and positive attitudes, which they used in real life to solve environmental problems. In relation to the experiential learning theory (see Kolb 2015),teachers succeeded in using outdoor strategies to engage learners in practical work from which they learn through experiencing the nature by recycling, trees and vegetable planting, which benefitted the schools in many ways. For instance, the schools earned money through fundraising by recycling and the sale of vegetables, schools' feeding schemes were supplemented by vegetables grown in the school gardens and some vulnerable learners were assisted by the same vegetables, schools have been cleaned and greened through litter picking and tree and flower planting, medicinal plants were used as part of teaching resources and as medicines to cure illnesses, soil erosion was prevented by planting grass and water was saved through checking and fixing leaks.

However, despite being successful in using such strategies for implementing EE, teachers in the primary schools in iLembe District have experienced a number of challenges in due course as discussed in section 4.2.3.6 above. Such challenges negatively affected both classroom and outdoor activities, thereby hampering the implementation of EE in the primary schools.

- How do teachers benefit from partnering with environmental programmes to teach EE in primary schools in iLembe district?

The discussions in chapter 4 indicated that the three participating schools for this study were affiliates or partners of environmental programmes namely the Eco-Schools and the SEEP. Results revealed that the programmes benefitted the teachers from those schools in many ways such as bringing awareness of environmental sustainability to schools, providing training to teachers in terms of workshops to equip teachers with environmental

expertise, providing teaching and learning resources and assisting schools by linking EE activities such as recycling and school gardening with the curriculum with practical environmental activities, equipping teachers with the skills of solving environmental problems such as pollution and water crises. From this, it can be concluded that partnering with environmental programmes has indeed greatly benefitted the teachers in the course of implementing EE in primary schools in iLembe Districts.

5.4 RECOMMENDATIONS

It is important that different components of the stakeholders, starting from government to the school communities, contribute to the successful implementation of EE in the primary schools. Following the findings of this study, the following are recommended in order to make a difference in primary schools in the course of EE implementation.

5.4.1 Government

As the major component of the stakeholders, government at all the levels, namely national, provincial and district, should collaborate with other components of the stakeholders such as the school communities, among others, to contribute positively to the implementation of EE in primary schools. The following duties are therefore recommended to be performed by government:

5.4.1.1 Partnerships to come up with various strategies of environmental education implementation

Partnerships among the stakeholders like the provincial Department of Education with other relevant governmental departments such as the Department of Environmental Affairs, the Department of Agriculture and the Department of Water and Sanitation, among others, are important for the implementation of EE in schools. It is therefore recommended that the aforementioned entities collaborate and make efforts to come up with strategies for implementing EE to assist primary schools in terms of addressing environmental issues such as nature conservation, water crises and the effects of environmental pollution by litter, among others, within the province.

5.4.1.2 More classrooms and space for gardens

The findings of this study revealed that some schools, especially in the townships were challenged by having overcrowded classrooms and limited space for gardening. Such challenges limit teachers from using classroom strategies such as group discussions and role plays as well as school gardening. To address this, it is therefore recommended that

the government assists such schools by providing mobile classes to address the challenge of overcrowding in classrooms as well as provision of transportation so that the schools will be able to go on a field trip at least once a year to places such as botanical gardens where for instance learners can learn about planting vegetables and trees and especially grade six learners can learn about indigenous plants, which is a topic for them in Social Science.

5.4.2 School

Schools have a combination of stakeholders, including teachers, learners and support staff. All of them have a significant role to play in terms of environmental affairs at schools. The results of this study showed that the load of work with regards to environmental activities was left to Eco-Schools committee members. To bring about success in the implementation of EE in primary schools, the following are recommended:

5.4.2.1 Environmental policies

Schools are responsible to create policies that govern environmental activities to ensure that every stakeholder in the school acts accordingly. The results of the study showed that the environmental policies found at the schools were designed under the guidance of the Eco-Schools and SEEP programmes, which implies that such schools did not have their own environmental policies before taking membership with the said programmes. It is therefore recommended that every primary school develop an environmental policy that specifies every stakeholder's responsibility and contributions towards the implementation of EE.

5.4.2.2 Environmental club membership with environmental programmes and projects

The results of the study showed that primary schools under the Eco-Schools and SEEP programmes formed committees and environmental clubs to champion environmental activities, which helped the schools to successfully implement EE. Environmental clubs are significant, as they spearhead environmental activities such as school gardening, recycling and participation in competitions for fundraising in schools. It is therefore recommended that primary schools, especially those that have never been members of the aforementioned programmes, make efforts to establish environmental clubs in order to promote the implementation of EE. Furthermore, the results also indicated that affiliation with programmes and projects benefits schools considerably in terms of resources and training for teachers in the form of workshops, thereby helping teachers to use proper strategies for teaching EE. It is therefore recommended that primary schools seek membership with as many programmes or projects as possible, as the more schools are affiliated with programmes or projects, the more they benefit.

5.4.2.3 Self-teacher development

The results of this study indicated that the confusion some primary school teachers in iLembe District experienced about how to teach or assess EE content, as integrated with other subjects, was due to lack of environmental expertise that made it difficult for them to use successful strategies. It is recommended that teachers themselves take initiative to develop their environmental competency in teaching EE. They can do this by furthering their studies in the field of EE or taking membership at personal level and participating in environmental programmes or projects such as SEEP and SAGSP. Teachers are encouraged not to wait for the DoBE to provide training for them. They should be intrinsically motivated and cultivate the zeal to develop themselves professionally in the field of EE. This will help teachers acquire environmental expertise and increase their confidence as they teach EE.

5.4.2.4 School gardening

The results of the study showed that all the participating primary schools in iLembe District had school gardens where vegetables and trees, some of which were medicinal, were planted. Schools should endeavour to establish gardens where vegetables, trees and flowers, including medicinal plants, are planted. This is part of the significant outdoor strategies from which learners can learn and the plants are also valuable to the school environments as teaching and learning support materials, while the vegetables supplement schools' feeding schemes.

5.4.2.5 Compost making and recycling activities

The results of this study showed that compost making and recycling activities both have the potential of keeping the school environment clean, as waste is collected and turned into useful items. In addition, recycling earns money for the school and compost is useful as manure to enrich the soil for school gardening. In this regard, it is therefore recommended that schools encourage compost making and recycling activities.

5.4.2.6 Water and energy conservation

The findings of this study indicated that primary schools in iLembe District were putting effort into saving water and electricity by harvesting rainwater and turning lights off when not used. This is because South Africa is a water-scarce country, as discussed in Chapter 2, and electricity too has become a critical commodity. It is therefore recommended that

primary schools put all effort into ensuring that wastage of water and electricity is controlled.

5.5 AVENUES FOR FURTHER RESEARCH

This study was conducted in primary schools that were once members of the Eco-Schools programme. Further studies are recommended to be carried in primary schools that have never been affiliates of the Eco-Schools programme.

Furthermore, the challenges the study revealed with regard to teaching EE in primary schools are general and not directly in relation to the strategies used, which is a gap that needs to be filled. It is therefore also imperative that further studies be conducted in this field to ascertain challenges that are directly linked with the use of particular strategies for teaching EE in primary schools. Furthermore, even though the CAPS have guidelines for integrating EE content with all the subjects, the findings of this study revealed that teachers, more especially grades 3 and 6 teachers in primary schools in iLembe District, experienced challenges with integrating and assessing EE content. Further research is recommended to discover what the problem is, particularly with Mathematics teachers in the Foundation Phase and Intermediate Phase in primary schools regarding the strategies used for teaching and assessing of EE

5.6 LIMITATIONS OF THE STUDY

The findings of this study can only be generalised to primary schools, and more specifically to primary schools that were once members of the Eco-Schools programme. This means that it cannot be generalised to a larger population. In addition, everything did not go as initially planned. The researcher met considerable challenges due to the disruptions brought by Covid-19 pandemic coupled with time shortage, as the researcher could not spend long time with the participants to avoid Covid-19 infections, which was a negative aspect in terms of the credibility of this study. Furthermore, the participants in the third school declined having face-to-face interviews due to a fear of Covid-19 infection. They instead requested for document interviews in the form of answering the interview questions at their convenience and sending them back to the researcher. This limited the researcher from probing, which would have aided the researcher to get more information. Furthermore, the initial plan of having focus group discussions with the participants also did not work out due to the high risk of infections, which also limited the researcher from obtaining more data from focus group.

5.7 CONCLUDING REMARKS

The concluding remarks about this study are based on the reflection on my experiences throughout the journey of this study. This is discussed below under three areas of enrichment as personal, academic and professional.

5.7.1 Personal

Personally, throughout this study, I saw myself as a fighter and one who can endure difficult situations. This is because the journey was a very tough one throughout this study. I endured situations such as being involved in car accidents twice, sickness and loss of loved ones as well as also being personally a victim of the Covid-19 pandemic, which hampered my progress. However, seeing myself having come this far, against all odds, has proved my resilience to keep pushing no matter what the situation, which has given me personal belief and confidence. Not only that, this study has changed my behaviour, built in me positive attitudes towards the environment and has increased my love for nature more than ever before. It has developed me as a person who can act according to environmental laws and it has instilled in me problem-solving skills to tackle environmental problems at a personal level.

5.7.2 Academic

Academically, this study transformed me into a researcher, one who can identify a problem and look for solutions to such problem. Both the scholarly review and the empirical research activities for data collection increased my love for academic issues. The scholarly review in particular greatly improved my academic writing and referencing skills, thereby laying the foundation and creating the zeal for pursuing further studies or research. Furthermore, the study also opened avenues for further studies to be conducted in the same field by either the participants or other people interested in pursuing such research.

5.7.3 Professional

This study has changed my life as a professional teacher, made me become aware of environmental issues and helped me gain knowledge, skills and values as well as strategies that I can use to ‘green the curriculum’. By this I mean being able to integrate EE into all the subjects across the curriculum as well as teaching and assessing EE with confidence.

In addition, this study boosted my confidence through presenting my chapters to fellow students and lecturers during a colloquium organised for masters and doctoral students at Unisa in Pretoria. From the time the corona pandemic broke out, safety protocols could not allow students to be called together for colloquiums, therefore virtual tutorial meetings were held. I attended the online tutorial meetings, presented my second chapter and also

had the opportunity to lead the meetings on some occasions as a programme director. Through these virtual meetings I have learned to use online platforms such as the Zoom and Microsoft Teams, which I can now confidently use at my workplace to organise and conduct online meetings with my colleagues. All this has developed me professionally and increased my confidence as a teacher. Furthermore, apart from me, the study has also enriched the participants through gaining more environmental knowledge, skills and values, which they can use for implementing EE in their schools.

LIST OF REFERENCES

Aditi, T 2018, 'Can environment education save our planet?', *Mongabay*, 14 September, viewed 27 March 2020, <https://india.mongabay.com/2018/09/can-environment-education-save-our-planet/>.

Almeida, S C, Barnes, M M & Moore, D 2018, 'Education for sustainability policies: Ramifications', *Australian Journal of Teacher Education*, vol. 43, no. 11, pp. 105-121.

AU (African Union), 2022, Agenda 2063: The Africa We Want, viewed 28 March 2022 <https://au.int/en/agenda2063/overview>

Avci, D E & Çeliker, H D 2015, Teacher's Suggestions for Recycling and Sustainable Environment: Reflections on Diaries. *Journal of Educational and Social Research*, *5*(1 S1), pp. 203-203.

Basias, N & Pollalis, Y, 2018, 'Quantitative and Qualitative Research in Business & Technology: Justifying a Suitable Research Methodology', Review of Integrative Business and Economics Research, vol. 7, no 1, pp. 91-105.

Baudoin, M, Vogel, C, Nortje, K & Naika, M, 2017, 'Living with drought in South Africa: lessons learnt from the recent El Niño drought period', *International Journal of Disaster Risk Reduction, no.* 23, pp. 128-137.

Beech, W, Lovells, H & Veltman, N 2017, *Environmental law and practice in South Africa: Overview*, Thomson Reuters Practical Law, viewed 27 April 2020, <https://uk.practicallaw.thomsonreuters.com/4-502-7865?transitionType=Default&contextData=(sc.Default)&firstPage=true&bhcp=1>.

Bell, F 2016, 'Empirical research in law', *Griffith Law Review*, vol. 25, no. 2, pp. 1839–4205.

Borrego, M, Finelli, C J, Prince, M, Nguyen, K A, Tharayil, S, Shekhar, P & Waters, C 2018, 'Strategies to mitigate student resistance to active learning', *International Journal of STEM Education*, no. 7, pp. 1-16.

Bouchrika, I 2020, *What is empirical research? Definition, types & samples*, Research.com, viewed 13 May 2021, <https://www.guide2research.com/research/what-is-empirical-research>.

Buthelezi, S A 2015, *Assessment of the availability and effectiveness of environmental education through the Eco-Schools programme at Umzinyathi district schools*, MEd dissertation, University of South Africa, Pretoria.

Chetty, P 2016, *Importance of research approach in a research*, Project Guru, viewed 13 May 2021, <https://www.projectguru.in/selecting-research-approach-business-studies/>.

Collins, C S & Stockton, C M 2018, 'The central role of theory in qualitative research', *International Journal of Qualitative Methods*, vol. 17, pp. 1–10.

DEA (Department of Environmental Affairs) 2019, *The South African Green Schools Programme launched in Limpopo*, viewed 2 May 2020,

<https://www.environment.gov.za/mediarelease/SAgreenschoolsprogrammelaunchedlimpopo>.

DFFE (Department of Forestry, Fisheries and the Environment) 2019, *South African National Biodiversity Institute (SANBI)*, viewed 29 November 2020, <https://www.environment.gov.za/statutorybodies/sanbi>.

DHET (Department of Higher Education and Training) 2017, *National Policy on Curriculum Development and Implementation in Community Education and Training Colleges*, viewed 6 May 2020, <http://www.dhet.gov.za/SiteAssets/Community%20College/National%20policy%20on%20curriculum%20development.pdf>.

DoBE (Department of Basic Education) 1995, *White Paper on Education and Training*, Government Printer, Pretoria.

DoBE (Department of Basic Education) 2010a, *Education Information Standards: Dictionary of Education Concepts and Terms 2010*, viewed 4 April 2021, <https://www.education.gov.za/Portals/0/Documents/Publications/Dictionary%20of%20Education%20final.pdf?ver=2015-01-29-112633-100>.

DoBE (Department of Basic Education) 2010b, *Policies: Access to schools*, viewed 28 August 2020, <https://www.education.gov.za/Resources/Policies.aspx>.

DoBE (Department of Basic Education) 2011a, *Curriculum and Assessment Policy Statement: Grade 4–6 Life Skills*, Government Printing Works, Pretoria.

DoBE (Department of Basic Education) 2011b, *Curriculum and Assessment Policy Statement: Intermediate Phase Grades 4–6 Mathematics*, Government Printing Works, Pretoria.

DoBE (Department of Basic Education) 2011c, *Dictionary of Education Concepts and Terms*, viewed 27 August 2020, <https://www.gov.za/sites/default/files/gcis_document/201409/34346gon487b.pdf>.

DoBE (Department of Basic Education) 2019, *Curriculum Assessment Policy Statements (CAPS)*, viewed 25 April 2020, <https://www.education.gov.za/Curriculum/CurriculumAssessmentPolicyStatements(CAPS).aspx>.

DoBE (Department of Basic Education) 2020, *Do you want to make a difference? Then become a teacher*, viewed 1 May 2020, <https://www.education.gov.za/Informationfor/Teachers/InitialTeacherEducation.aspx>.

Donnenfeld, Z, Crookes, C & Hedden, S 2018, *A delicate balance: Water scarcity in South Africa*, Water Research Commission, viewed 12 January 2021,

<http://www.wrc.org.za/wp-content/uploads/mdocs/ISS_A%20delicate%20balance.pdf>.

Dorn, C 2020, 'A New Global Ethic: A History of the United Nations International Environmental Education Program, 1975-1995', *Foro de Educación*, vol. *18, no.* 2, pp.83-108.

Dudovskiy, J 2019, *Research methodology: Purposive sampling*, Business Research Methodology, viewed 23 August 2019, <https://research-methodology.net/sampling-in-primary-data-collection/purposive-sampling/>.

Eco-Schools, 2021, *Eco-Schools History*, viewed 29 March 2022, <https://www.ecoschools.global/our-history>.

Eco-Schools 2019, *Seven steps towards an Eco-School*, viewed 5 April 2021, <https://www.ecoschools.global/seven-steps>.

Ehrens, T 2015, implementation, viewed 22 March 2022, <https://www.techtarget.com/searchcustomerexperience/definition/implementation>.

ERO (Education Review Office) 2016, *Transition from primary to secondary school*, viewed 5 May 2020, <https://www.ero.govt.nz/publications/evaluation-at-a-glance-transitions-from-primary-to-secondary-school/6-transition-from-primary-to-secondary-school/>.

Faragallah, N A F 2016, *Environmental education in Egypt: A preliminary assessment*, MEd dissertation, The American University, Cairo.

Favaro, K 2015, 'Defining strategy, implementation, and execution', *Harvard Business Review*, 31 March, viewed 8 June 2020, <https://hbr.org/2015/03/defining-strategy-implementation-and-execution>.

Finzi, E 2015, *What is a teaching strategy?*, Quora, viewed 4 May 2020, <https://www.quora.com/What-is-a-teaching-strategy>.

Franca, L F, Nunes, M E R & Paiva, L V 2017, 'Efficacy of different strategies in environmental education teaching: Association between research and university extension', *Ambiete and Sociedade*, vol. 20, no. 2, pp. 1809–4422.

Fulbrook, P, 2019, 15 Learning Theories in Education (A Complete Summary), viewed 27 September 2021, <https://teacherofsci.com/learning-theories-in-education/>.

Gough, N 2016, 'Australian outdoor (and) environmental education research: Senses of "place" in two constituencies' *Journal of Outdoor and Environmental Education*, vol. 19, no. 2, pp. 2–11.

Green, R 2019, *Importance of conceptualization in social research*, The Tiny Children's Garden, viewed 29 November 2020,

<https://iris.siue.edu/ttcg/2019/10/10/importance-of-conceptualization-in-social-research/>.

Grover, V K 2015, 'Research approach: An overview', *Golden Research Thoughts Journal*, vol. 4, no. 8, pp. 2231–5063.

GSP (Great Schools Partnership) 2015, *Curriculum*, viewed 5 May 2020, <https://www.edglossary.org/curriculum/>.

Gupta, R, Fraser, J, Shane-Simpson, C, Danoff-Burg, S & Ardalan, N 2019, 'Estimating scale, diversity, and professional training of environmental educators in the US', *Environmental Education Research*, vol. 25, no. 1, pp. 75–91.

Ismail, R 2017, *Exploring how Science teachers engage in curriculum innovating in environment and sustainability education*, PhD thesis, University of KwaZulu-Natal, Pietermaritzburg.

Ivankova, N V, Creswell, J W & Plano Clark, V L 2016, 'Foundations and approaches to mixed methods research', in K Maree (ed), *First steps in research*, Van Schaik, Pretoria.

Jansen, J D 2016, 'Introduction to the language of research', in K Maree (ed), *First steps in research,* Van Schaik, Pretoria.

Juni Bayu Saputra, J B & Mokhamad S A A 2014, *Teaching Strategies*, viewed 27 March 2022, <https://www.researchgate.net/publication/327433965_TEACHING_STRATEGIES>.

Kalorth, N & Sreekumar, R 2015, 'Media initiation in environmental education: An Indian model of environmental pedagogy', *Earth Common Journal*, vol. 5, no. 1, pp. 1-14

Kaur, H & Chandigarh, U I L S 2015, *Mixed methods research*, Academike, viewed 13 May 2021, <https://www.lawctopus.com/academike/mixed-methods-research/>.

Kendra, C 2020, *The experiential learning theory of David Kolb*, verywellmind, viewed 30 November 2020, <https://www.verywellmind.com/experiential-learning-2795154>.

Kimaro, A R 2018, *Integrating environmental education (EE) for sustainability into primary school curriculum in Tanzania: Exploring stakeholders' views and perceptions*, MEd dissertation, Dar es Salaam University, Dar es Salaam.

Kivunja, C & Kuyini, A B 2017, 'Understanding and applying research paradigms in educational contexts', *International Journal of Higher Education*, vol. 6, no. 5, pp. 26-41.

Kivunja, C 2018, 'Distinguishing between theory, theoretical framework, and conceptual framework: A systematic review of lessons from the field', *International Journal of Higher Education*, *7*(6), pp.44-53.

Knutsson, B 2020, 'Managing the gap between rich and poor? Bio-politics and (ab)normalized inequality in South African education for sustainable development', *Environmental Education Research*, vol. 26, no. 5, pp. 1469–5871.

Kolb, D A 2015, *Experiential learning: Experience as the source of learning and development*, 2nd edn, Pearson Education, New Jersey.

Korstjens, I & Moser, A 2018, 'Series: Practical guidance to qualitative research. Part 4: Trustworthiness and publishing', *European Journal of General Practice*, vol. 24, no. 1, pp. 120–124.

Leedy, P D & Ormrod, J E 2010, *Practical research: Planning and design*, 9th edn, Pearson Education, New Jersey.

Luiza, O, Barry W R & Schalk P R 2017, *Sustainable environmental management indicators in South African primary schools*, MEd dissertation, North-West University, Potchefstroom.

MacInnis, B & Krosnick, J, 2020, Climate *Insights 2020: Natural Disasters: Surveying American Public Opinion on Climate Change and the Environment, viewed 20 March 2021,* <https://www.rff.org/publications/reports/climateinsights2020-natural-disasters/>.

Makokotlela, M V 2016, *Determining the effectiveness of environmental education initiatives of selected government departments in South Africa*, PhD thesis, University of South Africa, Pretoria.

Makua, M P & Odeku, K O, 2017, 'Harmful mining activities, environmental impacts and effects in the mining communities in South Africa: a critical perspective', *Environmental Economics, vol.* 8, no. 4, pp. 14-24.

Maluleke, H M 2015, *Curriculum policy implementation in the South African context, with reference to environmental education within the natural sciences*, PhD thesis, University of South Africa, Pretoria.

Mapotse, T A & Mashiloane, T K 2017, 'Nurturing learners' awareness of littering through environmental campaigns: An action research approach', *EURASIA Journal of Mathematics Science and Technology Education*, vol. 13, no. 10, pp. 1305–8223.

Maree, K 2016, 'Planning a research proposal', in K Maree (ed), *First steps in research,* Van Schaik, Pretoria.

Maree, K & Pietersen, J 2016, 'Sampling', in K Maree (ed), *First steps in research,* Van Schaik, Pretoria.

Matsekoleng, T K 2017, *Learners' environmental awareness, effects on home and school practices towards littering: an action research case*, MEd dissertation, University of South Africa, Pretoria.

Mawela, A S 2020, 'Teacher's views on support by environmental non-governmental organizations in selected Alexandra township primary schools', *KOERS - Bulletin for Christian Scholarship*, vol. 85, no. 1, pp. 1-13.

Mboweni, M S J 2019, *(De)Littering: Caring for teaching and learning spaces*, viewed 8 June 2020, <https://heltasa2019.co.za/downloads/mdumo_mboweni.pdf>.

McCrohan, S 2017, *Environmental education in Tanzania*, Arizona Association for Environmental Education, viewed 29 November 2020, <https://www.arizonaee.org/ee-around-the-world/environmental-education-tanzania/>.

McGee, K 2018, *Definition of primary education*, the classroom, viewed 5 May 2020, <https://www.theclassroom.com/definition-primary-education-5076822.html>.

McMillan, J H & Schumacher, S 2010, *Research in education: Evidence-based inquiry*, 7th edn, Pearson Education, New Jersey.

McShane, M Q & Lueken, M 2018, *What is empirical evidence?*, ENGAGE, viewed 13 May 2021, <https://www.edchoice.org/engage/what-is-empirical-evidence/>.

Mohammed, I I S 2016, *The implementation of environmental education at Muslim schools in Gauteng: A case study*, MEd dissertation, University of South Africa, Pretoria.

Munasi, K R 2019, *Integrating environmental education in the Life Sciences curriculum in the Vhembe District, Limpopo*, PhD thesis, University of South Africa, Pretoria.

Nieuwenhuis, J 2016, 'Qualitative research designs and data-gathering techniques', in K Maree (ed), *First steps in research,* Van Schaik, Pretoria.

OCHA, 2021. *Tropical Cyclone Eloise - Jan 2021, viewed 20 March 2021,* <https://reliefweb.int/disaster/tc-2021-000008-moz>.

O'Donoghue, R & van Rensburg, J E 1995, *Environments and Methods*. Howick: Share-Net

Perera, S 2018, *Research paradigms*, Workshop on Research Methodology, 2 August, viewed 12 May 2021, <http://www.natlib.lk/pdf/Lec_02.pdf>.

Rada, E C, Bresciani, C, Girelli, E, Ragazzi, M, Schiavon, M & Torretta, V, 2016, 'Analysis and Measures to Improve Waste Management in Schools', Sustainability, vol. 8, no. 9, pp. 840.

Rahman, N A, Halim, L, Ahmad, A R & Mastura, T S 2018, 'Challenges of environmental education: Inculcating behavioural changes among indigenous students', *Creative Education*, vol. 9, no. 1, pp. 43-55.

Rehman, A A & Alharthi, K 2016, 'An introduction to research paradigms', *International Journal of Educational Investigations*, vol. 3, no. 8, pp. 2410–3446.

RSA (Republic of South Africa) 1996, *Constitution of the Republic of South Africa, 1996, Chapter 2: Bill of Rights*, Government Printer, Pretoria.

Ruthanam, M, Reddy, P & Pillay, D 2021, 'Teachers' Choices of Teaching Methods for Environmental Education: A case study of Life Skills teachers at a primary school in South Africa', *Southern African Journal of Environmental Education*, *37*.

SACE (South African Council for Educators) 2020, *The code of professional ethics (as amended)*, viewed 7 May 2020, <https://www.sace.org.za/pages/the-code-of-professional-ethics>.

SAEP (South African Education Project) 2021, *The South African Education and Environment Project (SAEP)*, viewed 5 April 2021, <https://www.givengain.com/c/saep/>.

Sanders, S 2018, *An Investigation into the State of Environmental Education and the use of Technology in Environmental Education in Gauteng, South Africa*. MEd dissertation,University of Johannesburg, Johannesburg.

Sanders, S & Schoeman, T 2019, *An Investigation into the State of Environmental Education and the use of Technology in Environmental Education in Gauteng, South Africa* , Johannesburg, November.

SANParks 2020, *Kids in Parks*, viewed 2 May 2020, <https://www.sanparks.org/conservation/people/education/kidsinparks/default.php>.

Schudel, I, Songqwaru, Z, Tshiningayamwe, S & Lotz-Sisitka, H 2021, *Teaching and Learning for Change: Education and Sustainability in South Africa*. African Minds, Cape Town.

Schunk, D H 2012, *Learning theories: An educational perspective*, 6th edn, Pearson Education, Boston.

Singh, P K & Singh, R L 2016, *Global environmental problems*, viewed 12 November 2019, <https://link.springer.com/chapter/10.1007/978-981-10-1866-4_2>.

Sousa, L O, Richter, B W & Raath, S P 2017, 'Sustainable environmental management indicators in South African primary schools', *Sustainability*, 19 May, pp. 16–19.

Swanson, R A & Chermack, T J 2013, *Theory building in applied disciplines*, Berrett-Koehler Publishers.

Theofanidis, D & Fountouki, A 2018, 'Limitations and delimitations in the research process', *Perioperative Nursing*, vol. 7, no. 3, pp. 155–162.

The World Bank, 2019, Restoring *Zimbabwe's Livelihoods, Infrastructure After Cyclone Idai,* viewed 20 March 2021, <https://www.worldbank.org/en/news/feature/2019/09/16/restoring-zimbabwes-livelihoods-infrastructure-after-cyclone-idai>.

Thomas, R M 2018, Environmental engagement through behaviour change interventions: A case study of litter reduction in New Zealand Schools, PhD thesis, Victoria University of Wellington, Wellington.

Thompson, K 2016, *Non-participant observation*, Revise Sociology, viewed 9 May 2021, <https://revisesociology.com/2016/04/01/non-participant-observation/>.

Treagust, D F, Amarant, A, Chandrasegaran, A L, & Won M, 2016, 'A case for enhancing environmental education programs in schools: Reflecting on primary school students' knowledge and attitudes', *International Journal of Environmental & Science Education*, vol. 11, no. 12, pp. 5591–5612.

UN (United Nations) 1972, *United Nations Conference on the Human Environment, 5-16 June 1972, Stockholm*, viewed 28 March 2022, <https://www.un.org/en/conferences/environment/stockholm1972>

UN (United Nations) 1992, *United Nations Conference on Environment & Development, Rio de Janeiro, Brazil, 3 to 14 June 1992: AGENDA 21*, viewed 29 March 2021, <https://sustainabledevelopment.un.org/content/documents/Agenda21.pdf>.

UN (United Nations) 2020, *UN environment strategy for environmental education and training*, viewed 6 May 2020, <https://www.unenvironment.org/about-un-environment/policies-and-strategies/un-environment-strategy-environmental-education-and>.

UNESCO (United Nations Educational, Scientific and Cultural Organization) 1977, *Intergovernmental Conference on Environmental Education organized by UNESCO in co-operation with UNEP Tbilisi (USSR): Final report*, viewed 29 November 2020, <https://unesdoc.unesco.org/ark:/48223/pf0000032763>.

UNESCO (United Nations Educational, Scientific and Cultural Organization), 2017, *Education for Sustainable Development Goals: Learning Objectives,* Paris France.

UNESCO (United Nations Educational, Scientific and Cultural Organization) 2019, *Teachers*, viewed 7 May 2020, <https://en.unesco.org/themes/teachers>.

UNESCO (United Nations Educational, Scientific and Cultural Organization) 1995, *Two decades of successful interagency cooperation for the worldwide promotion of environmental education*, viewed 28 March 2022, <https://unesdoc.unesco.org/ark:/48223/pf0000153491>

UNESCO (United Nations Educational, Scientific and Cultural Organization), 2021, UN Decade of ESD, viewed 28 March 2022, <https://en.unesco.org/themes/education-sustainable-development/what-is-esd/un-decade-of-esd>.

Van Dijk-Wesselius, J E, Van den Berg, A E, Maas, J & Hovinga, D 2020, 'Green schoolyards as outdoor learning environments: Barriers and solutions as

experienced by primary school teachers', *Frontiers in Psychology*, vol. 10, pp. 2919.

Walliman, N (ed) 2018, *Research methods: The basics*, 2nd edn, Routledge, New York.

WESSA (Wildlife and Environmental Society of South Africa) 2020, *WESSA Eco-Schools*, viewed 3 May 2020, <http://wessa.org.za/wessa-eco-schools/>.

Winchester, C L & Salji, M 2016, 'Writing a literature review', *Journal or Clinical Urology*, vol. 9, no. 5, pp. 308-312.

Zwelibanzi, C M 2016, *An investigation into issues and challenges in implementing environmental education in special schools in South Africa*, PhD thesis, University of South Africa, Pretoria.

APPENDICES

APPENDIX A: UNISA ETHICS CLEARANCE CERTIFICATE

UNISA university of south africa

UNISA COLLEGE OF EDUCATION ETHICS REVIEW COMMITTEE

Date: 2021/03/10

Ref: 2021/03/10/59497246/24/AM
Name: Mr MP Gule
Student No.: 59497246

Dear Mr MP Gule

Decision: Ethics approval from
2021/03/10 to 2024/03/10

Researcher(s): Name: Mr MP Gule

E-mail address: 59497246@mylife.unisa.ac.za Telephone: 073 079 8403

Supervisor(s): Name: Dr M.V. Makokotlela
E-mail address: emakokm@unisa.ac.za Telephone: 012 429 4881

Title of research:

Strategies of implementing environmental education in primary school curriculum in Ilembe district, KwaZulu-Natal: Teachers' experiences

Qualification: MEd Environmental Education

Thank you for the application for research ethics clearance by the Unisa College of Education Ethics Review Committee for the abovementioned research. Ethics approval is granted for the period 2021/03/10 to 2024/03/10.

The low risk application was reviewed by the Ethics Review Committee on 2021/03/10 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 will ensure that the research project adheres to the relevant guidelines set out in the Unisa Covid-19 position statement on research ethics attached.
2. The researcher(s) will ensure that the research project adheres to the values and principles expressed in the Unisa Policy on Research Ethics.

3. Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study should be communicated in writing to the Unisa College of Education Ethics Review Committee.
4. The researcher(s) will conduct the study according to the methods and procedures set out in the approved application.
5. Any changes that can affect the study-related risks for the research participants, particularly in terms of assurances made with regards to the protection of participants' privacy and the confidentiality of the data, should be reported to the Committee in writing.
6. The researcher will ensure that the research project adheres to any applicable national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the specific field of study. Adherence to the following South African legislation is important, if applicable: Protection of Personal Information Act, no 4 of 2013; Children's act no 38 of 2005 and the National Health Act, no 61 of 2003.
7. Only de-identified research data may be used for secondary research purposes in future on condition that the research objectives are similar to those of the original research. Secondary use of identifiable human research data requires additional ethics clearance.
8. No field work activities may continue after the expiry date 2024/03/10. Submission of a completed research ethics progress report will constitute an application for renewal of Ethics Research Committee approval.

Note:

The reference number 2021/03/ 10/59497246/24/AM should be clearly indicated on all forms of communication with the intended research participants, as well as with the Committee.

Kind regards,

Prof AT Motlhabane CHAIRPERSON:
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motlhat@unisa.ac.za

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APPENDIX B: REQUEST FOR PERMISSION FROM THE DISTRICT DIRECTOR, ILEMBE DISTRICT TO CONDUCT RESEARCH

Title of the research: Strategies of implementing environmental education in primary schools in iLembe District, KwaZulu-Natal: Teachers' experiences

Date: 28 JUNE 2021

To: The District Director
Department: Education
Tel: 032 439 6103
Email address: nombali.mbatha@kzndoe.gov.za

Dear Dr L.M.M.S. Madondo

I, Mark Poison Gule, a teacher at Nyakana Primary School, am doing research under supervision of Dr Matlala Violet Makokotlela, a lecturer in the Department of Science and Technology Education, towards an MEd at the University of South Africa. We are writing to you to seek your permission to conduct research at three of the primary schools in iLIlembe district, namely Aldenville, Kearsney and St. Christopher's.

The aim of the study is to explore how successful the primary school teachers are with the strategies they use to implement environmental education in Ilembe district.

The benefits of this study: The teachers should be able to use successful strategies to teach environmental education. They should also be able to use the knowledge and skills they gain from the study to protect and improve the environment of the schools and that of their communities.

Potential risks: Feeling uncomfortable or unwell during the interviews due to long sitting and talking. The cost of data, as interviews may be conducted virtually due to Covid-19 restrictions. However, if Covid-19 restrictions are relaxed, face-to-face interviews will take place and no cost of data will be incurred. There will be no reimbursement or any incentives for participation in the research.

Steps to be taken in case of risks: The school's first-aid kit will be used with the help of the trained teacher who is in charge. The nearby clinic will be consulted if the efforts of first aid fail.

Feedback procedure: The researcher will verbally report to the District Director, the principals of the participating schools and the teachers whenever deemed necessary. A written report will also be provided at the end of the project to the District Director, the Circuit Manager, the principals and the teachers.

Yours sincerely

Mr Mark Poison Gule

Educator at Nyakana Primary School

APPENDIX C: KZN DEPARTMENT OF EDUCATION APPROVAL LETTER

KWAZULU-NATAL PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

OFFICE OF THE HEAD OF DEPARTMENT

Private Bag X9137, PIETERMARITZBURG, 3200
Anton LembedeBuilding, 247 Burger Street, Pietermaritzburg, 3201
Tel: 033 392 1051
Email: buyi.ntuli@kzndoe.gov.za

Enquiries: Buyi Ntuli **Ref.**:2/4/8/7122

Mr Mark Poision Gule

P.O. Box 3434
STANGER
4480

Dear Mr Gule

PERMISSION TO CONDUCT RESEARCH IN THE KZN DoE INSTITUTIONS

Your application to conduct research entitled: **"STRATEGIES OF IMPLEMENTING ENVIRONMENTAL EDUCATION IN PRIMARY SCHOOL CURRICULUM IN ILEMBE DISTRICT, KWAZULU NATAL: TEACHERS' EXPERIENCES",** in the KwaZulu-Natal Department of Education Institutions has been approved. The conditions of the approval are as follows:

1. The researcher will make all the arrangements concerning the research and interviews.
2. The researcher must ensure that Educator and learning programmes are not interrupted.
3. Interviews are not conducted during the time of writing examinations in schools.
4. Learners, Educators, Schools and Institutions are not identifiable in any way from the results of the research.
5. A copy of this letter is submitted to District Managers, Principals and Heads of Institutions where the Intended research and interviews are to be conducted.
6. The period of investigation is limited to the period from 28 June 2021 to 31 August 2023.
7. Your research and interviews will be limited to the schools you have proposed and approved by the Head of Department. Please note that Principals, Educators, Departmental Officials and Learners are under no obligation to participate or assist you in your investigation.
8. Should you wish to extend the period of your survey at the school(s), please contact Miss Phindile Duma at the contact numbers above.
9. Upon completion of the research, a brief summary of the findings, recommendations or a full report/dissertation/thesis must be submitted to the research office of the Department. Please address it to The Office of the HOD, Private Bag X9137, Pietermaritzburg, 3200.
10. Please note that your research and interviews will be limited to schools and institutions in KwaZulu-Natal Department of Education.

Dr. EV Nzama
Head of Department: Education
Date: 28 June 2021

APPENDIX D: REQUEST FOR PERMISSION FROM THE PRINCIPAL TO CONDUCT RESEARCH AT ALDENVILLE PRIMARY SCHOOL

Title of the research: Strategies of implementing environmental education in primary schools in iLembe District, KwaZulu-Natal: Teachers' experiences

Date: 28 JUNE 2021

To: Principal
Department: Education
Tel: 032 559 8046
Email address: aldenvillesp@gmail.com

Dear Sir/Madam

I, Mark Poison Gule, a teacher at Nyakana Primary School, am doing research under supervision of Dr Matlala Violet Makokotlela, a lecturer in the Department of Science and Technology Education, towards an MEd at the University of South Africa. We are writing to you to seek your permission to conduct research at your school.

Your school has been selected because it has been a member of the Eco-Schools programme and we are convinced that your educators will be able to provide relevant information for the study.

The aim of the study is to explore how successful the primary school teachers are with the strategies they use to implement environmental education in iLembe district.

The benefits of this study: The teachers should be able to use successful strategies to teach environmental education . They should also be able to use the knowledge and skills they gain from the study to protect and improve the environment of the schools and that of their communities.

Potential risks: Feeling uncomfortable or unwell during the interviews due to long sitting and talking. The cost of data, as interviews may be conducted virtually due to Covid-19 restrictions. However, if Covid-19 restrictions are relaxed, face-to-face interviews will take place and no cost of data will be incurred. There will be no reimbursement or any incentives for participation in the research.

Steps to be taken in case of risks: The school's first-aid kit will be used with the help of the trained teacher who is in charge. The nearby clinic will be consulted if the efforts of first aid fail.

Feedback procedure: The researcher will verbally report to the District Director, the principals of the participating schools and the teachers whenever is deem necessary. A written report will also be provided at the end of the project to the District Director, the Circuit Manager, the principals and the teachers.

Yours sincerely

_____

Mr Mark Poison Gule

Educator at Nyakana Primary School

APPENDIX E: REQUEST FOR PERMISSION FROM THE SCHOOL GOVERNING BODY TO CONDUCT RESEARCH AT ALDENVILLE PRIMARY SCHOOL

Title of the research: Strategies of implementing environmental education in primary schools in iLembe District, KwaZulu-Natal: Teachers' experiences

Date: 28 JUNE 2021

To: Chairperson, School Governing Body
Department: Education
Tel: 032 5598 046
Email address: aldenvillesp@gmail.com

Dear Sir/Madam,

I, Mark Poison Gule, a teacher at Nyakana Primary School am doing research under supervision of Dr Matlala Violet Makokotlela, a lecturer in the Department of Science and Technology Education, towards an MEd at the University of South Africa. We are writing to you to seek your permission to conduct research at your school.

Your school has been selected because it has been a member of the Eco-Schools programme and we are convinced that your educators will be able to provide relevant information for the study.

The aim of the study is to explore how successful the primary school teachers are with the strategies they use to implement environmental education in iLIlembe district.

The benefits of this study: The teachers should be able to use successful strategies to teach Environmental Education. They should also be able to use the knowledge and skills they gain from the study to protect and improve the environment of the schools and that of their communities.

Potential risks: Feeling uncomfortable or unwell during the interviews due to long sitting and talking. The cost of data as interviews may be conducted virtually due to Covid-19 restrictions. However, if Covid-19 restrictions are relaxed, face-to-face interviews will take place and no cost of data will be incurred. There will be no reimbursement or any incentives for participation in the research.

Steps to be taken in case of risks: The school's first-aid kit will be used with the help of the trained teacher who is in charge. The nearby clinic will be consulted if the efforts of first aid fail.

Feedback procedure: The researcher will verbally report to the District Director, the principals of the participating schools and the teachers whenever is deem necessary. A written report will also be provided at the end of the project to the District Director, the Circuit Manager, the principal and the teachers.

Yours sincerely

_____

Mr Mark Poison Gule

Educator at Nyakana Primary School

APPENDIX F: PARTICIPANT INFORMATION SHEET: A LETTER OF CONSENT - EDUCATOR

Date: 28 JUNE 2021
Title: Strategies of implementing environmental education in primary schools in iLembe District, KwaZulu-Natal: Teachers' experiences

Dear educator,

My name is Mark Poison Gule and I am doing research under the supervision of Dr Matlala Violet Makokotlela, a lecturer in the Department of Science and Technology Education, towards an MEd at the University of South Africa.

We are inviting you to participate in a study titled: Strategies of implementing environmental education in primary school curriculum in iLembe District, KwaZulu-Natal: Teachers' experiences.

WHAT IS THE PURPOSE OF THE STUDY?

This study is expected to collect important information that could assist in exploring the strategies teachers use for teaching environmental education in primary schools. The study will further enable teachers to use suitable strategies to teach environmental education. Teachers will also be able to use the knowledge and skills they gain from the study to protect the natural resources of the schools and that of their communities.

WHY AM I BEING INVITED TO PARTICIPATE?

You are invited because I know your school has been participating in the Eco-Schools programme and that you as an educator have been fully involved in the activities of the programme. I am therefore convinced that you have the information I am looking for that could be of help to this study. I obtained your contact details from the principal of your school. The approximate number of participants for this study is six teachers in total from three schools. That means, there will be two teachers from each of the three participating schools, that is, one each from grades 3 and 6.

WHAT IS THE NATURE OF MY PARTICIPATION IN THIS STUDY?

The study involves having interviews with you and observing you in class as well as while doing your normal environmental outdoor activities. Due to the Covid-19 pandemic, the interviews may be conducted online and the researcher will only observe the school premises to establish the environmental activities that take place at the respective schools. The interview will be conducted at the convenience of the teachers, that is, either during lunch break or after school, whichever is suitable to the teachers, and it will take an approximate time of 1 hour. The interviews will be recorded using an audio-recording device, which will be used to supplement the jotted responses of the participants.

CAN I WITHDRAW FROM THIS STUDY EVEN AFTER HAVING AGREED TO PARTICIPATE?

Participating in this study is voluntary and you are under no obligation to consent to participation. If you do decide to take part, you will be given this information sheet to keep and be asked to sign a written consent form. You are free to withdraw at any time and without giving a reason.

WHAT ARE THE POTENTIAL BENEFITS OF TAKING PART IN THIS STUDY?

Participation in this will assist the participants individually or collectively, as they will acquire knowledge and skills that will enable them to use successful strategies for teaching environmental education as well as protecting the natural resources and improving the environments of their schools and communities.

ARE THERE ANY NEGATIVE CONSEQUENCES FOR ME IF I PARTICIPATE IN THE RESEARCH PROJECT?

The research activities will require you to sacrifice your time of your lunch break or may delay you from going home after school, which may cause inconvenience to you. Due to the Covid-19 pandemic, the interviews may be conducted virtually, which may incur expenses of data on you.

WILL THE INFORMATION THAT I CONVEY TO THE RESEARCHER AND MY IDENTITY BE KEPT CONFIDENTIAL?

You have the right to insist that your name 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.

Your answers may be reviewed by people responsible for ensuring that the research is done properly, including the transcriber, external coder and members of the Research Ethics Review Committee. Otherwise. Records that identify you will be available only to people working on the study, unless you give permission for other people to see the records.

Your anonymous data may also be used for other purposes, such as a research report, journal articles and/or conference proceedings. However, no individual participant will be identifiable in such publications. Please keep in mind though that it is sometimes impossible to make an absolute guarantee of confidentiality or anonymity, e.g. when focus groups are used as a data collection method.

HOW WILL THE RESEARCHER(S) PROTECT THE SECURITY OF DATA?

Hard copies of your answers will be stored by the researcher for a period of five years in a locked cupboard/filing cabinet in my office at school for future research or academic purposes; electronic information will be stored on a password-protected computer. Future use of the stored data will be subject to further Research Ethics Review and approval, if applicable. After the five-year period, the information will be permanently destroyed, that is, the hard copies will be shredded and electronic copies will be deleted.

WILL I RECEIVE PAYMENT OR ANY INCENTIVES FOR PARTICIPATING IN THIS STUDY?

There will be no payment or reward offered to the participants. However, in case of virtual interviews that may incur expenses on the participants in terms of data, the researcher will take full responsibility of that by providing data.

HAS THE STUDY RECEIVED ETHICS APPROVAL?

This study has received written approval from the Research Ethics Review Committee of the College of Education at Unisa. A copy of the approval letter can be obtained from the researcher if you so wish.

HOW WILL I BE INFORMED OF THE FINDINGS/RESULTS OF THE RESEARCH?

If you would like to be informed of the final research findings, please contact Mr Mark Poison Gule on cell phone number 073 079 8403 or email 59497246@mylife.unisa.ac.za. The findings are accessible for 12 months.

Should you require any further information or want to contact the researcher about any aspect of this study, please contact Mark Poison Gule on cell phone number 073 079 8403 OR email: 59497246@mylife.unisa.ac.za.

Should you have concerns about the way in which the research has been conducted, you may contact Dr Matlala Violet Makokotlela on telephone number 012 429 4881 OR email: Emakokm@unisa.ac.za.

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

_____
Mark Poison Gule
Educator at Nyakana Primary School

INTERVIEW TRANSCRIPT

Interview transcript of teacher SAT1G3 at school A

Researcher: Good morning Sir!

Participant: Good morning to you too Sir! How are you doing?

Researcher: I am doing well, thank you!

Participant: You are welcome…

Researcher: Alright, before we proceed with our interview, I would like to thank you for offering your time for this interview.

Participant: You are welcome again…

Researcher: Okay, I am sure you have read the participant information sheet that was provided to you, so, you are fully aware that this conversation is treated as confidential.

Participant: Okay, yes I have read it and I am aware of that.

Researcher: Great! So, we are good to start with the questions! I am going to ask you the first question.

Participant: Okay…

Researcher: What strategies do you use to teach environmental content?

Participant: We use both classroom and outdoor strategies to teach EE. In the classroom, especially in Life Skills, I integrate the skills of saving water by asking learners to design posters. I also give learners worksheets to complete on an environmental issue; role plays with drama on saving water and showing videos about the effect of littering. About outdoor teaching, we do planting of trees and vegetables in our school; picking litter for recycling and we also do river cleaning.

Researcher: Great! The second question is: what type of teaching and learning support materials do you use to teach environmental content?

Participant: In the classroom we use learners' textbooks, pamphlets from Eco-Schools, worksheets, environmental charts, computers and projectors for showing videos. Outside, we use the garden equipment like the hoes, spades, shovels etc. supplied by the NGOs.

Researcher: Okay thank you! The third question is: what kinds of support do you receive from the DoBE and governmental and non-governmental organisations regarding the implementation of environmental education in your school?

Participant: We do not get a lot of support from the DoBE except in form of textbook and charts. But we get more support from the NGOs or programmes such as the Eco-Schools, the SEEP and umhlali country club. They organise workshops to train teachers, provide

seeds and seedlings as well as garden tools. The local municipality also provides bags for recycling.

Researcher: What natural resources do you conserve at your school?

Participant: We save water. Before Covid-19, we had a bucket with a cup at the door of each classroom for learners to drink water from. But that stopped when Covid-19 broke in. we also don't use hose pipe for watering our plants. We use water cans so that we can save water. We also encourage our learners to use tippy-taps for washing hands so that they don't open taps and leave water running when washing their hands. We also save electricity by turning off lights when not used. Apart from saving water and electricity, we also plant indigenous plants like aloes and we also plant grass to protect the soil from erosion.

Researcher: How successful have you been in using strategies for teaching environmental content in your school?

Participant: In many ways! Our learners have learnt to use bins to throw litter; they have also learnt to save water and electricity; they have learnt to plant trees and grow vegetables; the vegetables we produce supplement the feeding scheme of the school and we give some to vulnerable learners to take home. Now our school is clean and green! We also raise some money for the school through recycling.

Researcher: What challenges do you experience while teaching environmental content?

Participant: Challenges are also many! Our main challenge here is time shortage. This is because we have to teach EE with other subjects and it doesn't give us enough time. Integration is also challenging because it is confusing. Resources such as books are also not enough for every learner. Another big problem is water shortage. It makes it hard to grow vegetables. At one stage we ran out of water for two weeks and all the vegetables died. Covid-19 has become our new challenge too.

Researcher: Alright Sir, thank you so much!

Participant: You are welcome!

APPENDIX H: OBSERVATION CHECKLIST

The observations will be conducted on the school premises to establish how environmental content is taught through outdoor activities such as recycling and planting of trees, flowers and vegetables.

This will be guided by the following items:

1. The type of environment at which the school is located
2. The availability of gardens such as:

- vegetable gardens;
- trees and flowers; or
- medicinal gardens.

3. Recycling activities:

- The presence of litter such as paper, plastic and tins
- The availability of recycling bags and bins

4. Evidence of alternative sources of energy such as solar panels
5. The availability of sufficient space for outdoor environmental activities such as:
    - celebration of Arbour Day; or
    - green business activities for fundraising.
6. Evidence of natural resource conservation such as checking leaks
7. Evidence of compost making

UNISA

APPENDIX O: CONSENT TO PARTICIPATE IN THIS STUDY (Return slip

I, A. Panchan (participant name), 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 (or had 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 penalty.

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.

I agree to the recording of the interviews.

I have received a signed copy of the informed consent agreement.

Participant Name & Surname (please print) A. Panchan

Participant Signature

28-06-2021
Date

Researcher's Name & Surname (please print) MARK POISON GULE

Researcher's signature

28/06/21
Date

APPENDIX J: EDITOR'S CONFIRMATION LETTER

*Laetitia*BEDEKER

1 Semillon Close
Stonehaven Estate
Fish Hoek
Cell: 082 707 8428
[redacted]

Proof of editing

7 October 2021

This letter serves as proof that the MEd dissertation titled "Strategies of implementing environmental education in primary schools in iLembe district, KwaZulu-Natal: Teachers' experiences" by Mark Poison Gule was professionally copy (language) edited. The finalisation of tracked changes and comments inserted remains the responsibility of the student.

Kind regards

LM Bedeker
BA, Postgraduate Diploma (Translation) *cum laude*, MPhil (Translation) *cum laude*
Accredited member of the South African Translators' Institute (accreditation number 1001437)
Member of the Professional Editors' Group

APPENDIX K: TURNITIN REPORT

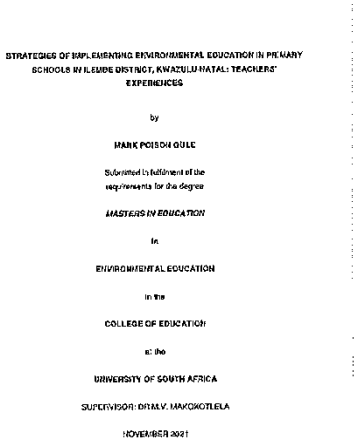
turnitin

Digital Receipt

This receipt acknowledges that Turnitin received your paper. Below you will find the receipt information regarding your submission.

The first page of your submissions is displayed below.

Submission author:	M P GULE
Assignment title:	Complete dissertation/thesis for examination
Submission title:	59497246 Gule_Dissertation (ed)-Final for Exams
File name:	59497246_Gule_Dissertation_ed_-Final_for_Exams.docx
File size:	4.1M
Page count:	142
Word count:	49,067
Character count:	279,401
Submission date:	12-Nov-2021 08:04AM (UTC+0200)
Submission ID:	1700514448



STRATEGIES OF IMPLEMENTING ENVIRONMENTAL EDUCATION IN PRIMARY SCHOOLS IN ILEMBE DISTRICT, KWAZULU-NATAL: TEACHERS' EXPERIENCES

by

MARK POISON GULE

Submitted in fulfilment of the requirements for the degree

MASTERS IN EDUCATION

in

ENVIRONMENTAL EDUCATION

in the

COLLEGE OF EDUCATION

at the

UNIVERSITY OF SOUTH AFRICA

SUPERVISOR: DR M.V. MAKGOKOTLELA

NOVEMBER 2021

APPENDIX L: AMENDMENT OF TITLE

V4

TITELWYSIGING
AMENDMENT OF TITLE

Student	**Mark Poison Gule**	Student No	**59497246**

Graad/Degree	**Masters degree**

Name of COD/Chair of the Departmental Higher Degrees Committee: Prof AV Mudau

U aanbeveling ten opsigte van die volgende voorgestelde gewysigde titel asseblief
Your recommendation regarding the following proposed amended title please

Titel/Title:
STRATEGIES OF IMPLEMENTING ENVIRONMENTAL EDUCATION IN PRIMARY SCHOOLS IN ILEMBE DISTRICT, KWAZULU-NATAL: TEACHERS' EXPERIENCES

Vorige titel/voorlopige titel/onderwerp:
Previous title/provisional title/topic:

STRATEGIES OF IMPLEMENTING ENVIRONMENTAL EDUCATION IN PRIMARY SCHOOL CURRICULUM IN ILEMBE DISTRICT, KWAZULU-NATAL: TEACHERS' EXPERIENCES AND PRACTICES

Handtekening/Signature: Datum/Date: 15/08/2021

Vir goedkeuring namens UKK asseblief
For approval by ECC please

Handtekening/Signature: Datum/Date:

To be completed by DHD administrative representative:

Prepared by: Ext: Date:

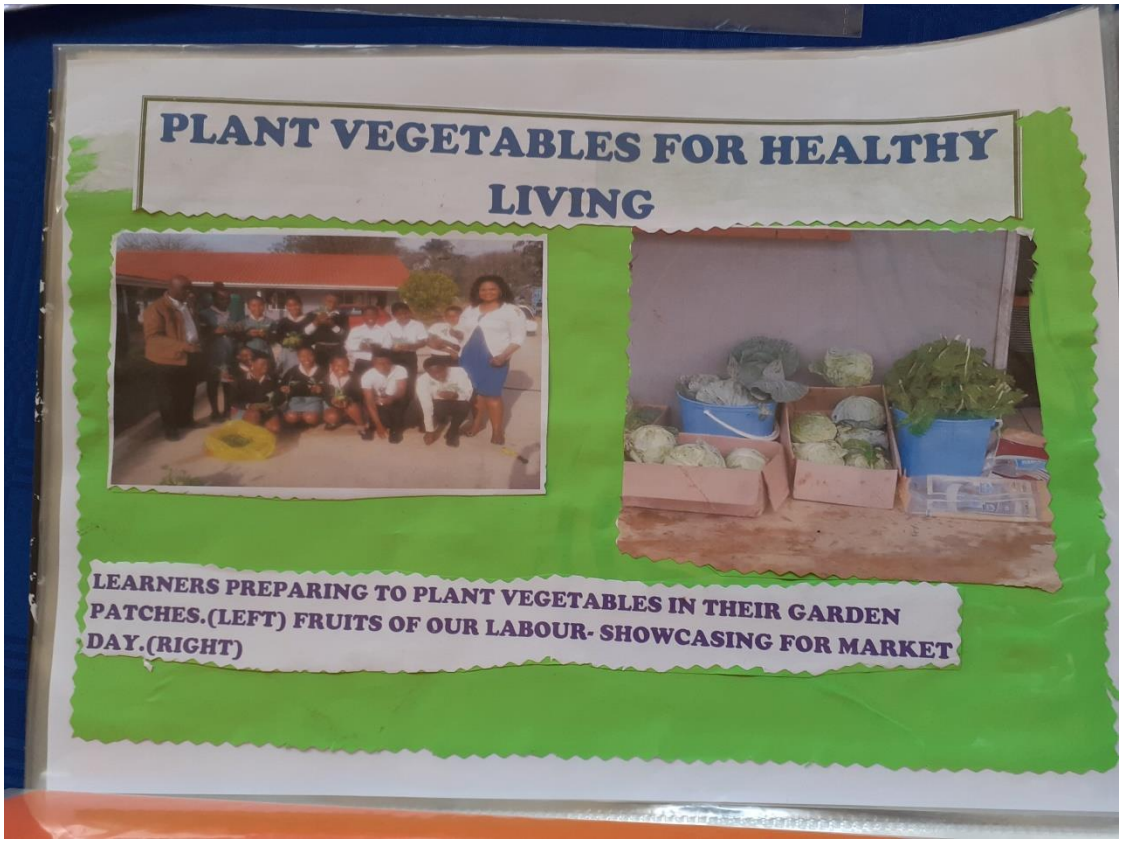
APPENDIX M: ADDITIONAL PHOTOS

Photo 4.1: Vegetables and fruit trees at Abiria primary

Photo 4.3: Greening and decorating flowers at Luge primary

Photos 4.6: Vegetables, flowers and a tree at Celina primary

Photo 4.7: Evidence of EE activity found in the Eco-Schools portfolio at Luge primary



Photos 4.8: Evidence of produce from school gardens on the wall at Abiria primary

Photo 4.9: Learners from Luge primary cleaning nearby river

Photo 4.10: Grade 6 learners from Luge primary designing posters