BARRIERS TO MANAGING ENVIRONMENTAL EDUCATION PROJECTS IN ALEXANDRA TOWNSHIP PRIMARY AND SECONDARY SCHOOLS

By

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DECLARATION

Student number: 40979628

I declare that **BARRIERS TO MANAGING EE PROJECTS IN ALEXANDRA TOWNSHIP PRIMARY AND SECONDARY SCHOOLS** is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

………………………………   ……………………………

SIGNATURE

(Mr. AS Mawela)   DATE

DEDICATION

This study is dedicated to my parents, **Tshambiluni Johana Mawela and Mbulaheni Elia Mawela,** my wife, **Rudzani Gloria Mawela** and children **Vhukhethwa, Vhuhulu and Vhuhone** You are the best presents - for your love and delight in seeing me prosper in my studies.

It is also dedicated to the people who made me what I am,

Dzulani zwanu Mudau wa Tshiheni tsha ha nya phunga tshena.

Musadzi wa phungatshena ndi mavhele.

Vhathanga na Vhasidzana vha sa fhiriho Dzivha la Fundudzi vha songo ranga u luvha. Ndi vhadau, vhakolo vha Nzhelele.

Vhasidzana na Vhathannga vha thaha dza mapango.

Ndi vharwa na vharwana vha Mawela murwa wa Nyatshikalanga.

Nwaniwapo dza la Mulendze. Phangami dza u luvha Mudzimu Khotsi.

Ahee!! Mudau wa Thsiheni Ahee!!

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ABSTRACT

Successful management of Environmental Education (EE) projects in schools is essential as it enhances teaching and learning in different subjects. The fact that EE is not a subject on its own, but is integrated into other subjects, has many detrimental effects with regard to the management of EE projects in schools. There are several barriers attached to the poor management of EE globally, in Africa and in South Africa. This study explored barriers to managing EE projects in Alexandra Township primary and secondary schools. This study was underpinned by total quality management theory. The research method used in the study followed a qualitative interpretative approach and data collection methods included a literature study, Participatory observation and open-ended questionnaires in order to examine the barriers to managing EE projects. Participants in the study were school principals, educators, subject facilitators and Institutional Development Support Officers (IDSOs). Findings indicated that, although school have EE projects, but there is a lack of competency and expertise in managing EE projects in schools. Non-governmental organisations are key role plays with expertise and competency in managing EE projects in schools. The study further indicated limited support offered by subject facilitators and IDSOs on how to manage EE projects in schools. However, there are number of factors that hinder successful management of EE projects in schools: these include lack of integration of EE into other subjects, lack of funds and other required resources, lack of time, and inadequate training. It was concluded that there were no systems in place that acted as a guideline for school principals and educators to overcome the barriers in EE project management in schools. It was concluded that school principals, educators and stakeholders, including subject facilitators and IDSO's should work together in managing EE projects in schools. Hence, this study calls attention to the provision of in-service training for EE project management for school principals, educators, subject facilitators and IDSOs. Further, more relevant resources should be provided to schools in order to manage EE projects.

KEY WORDS

Barriers; Environmental Education; Primary and secondary schools; Project management, Education

ABBREVIATIONS AND ACRONYMS

ALEX   Alexandra

CBOs   Community-based Organisations

DoE   Department of Education

EE   Environmental Education

EPA   Environmental Protection Agency

EEP   Environmental Education Project

EFS   Education for Sustainability

ELMS   Environment and Land Management Sector

ESD   Education for Sustainable Development

EEASA   Environmental Education Association of Southern Africa)

ESF   Education for Sustainable Future

FAO   Food and Agriculture organisation of United Nations

IDSO   Institutional Development Support Officer

JHB   Johannesburg

NADEET   Namibia Desert Environmental Education Trust

PM   Project Management

RSA   Republic of South Africa

SADC   Southern African Development Community

SAJE   South African Journal of Education

SEC   School Environmental Committee

SEMP   School Environmental Management Plan

SGB   School Governing Body

SMP   School Management Plan

SMT   Systemic Management Theory

UNECE   United Nations Economic Commission for Europe

UNESCO   United Nations Educational, Scientific and Cultural Organization

UNEP   United Nations Environment Programme

UNISA   University of South Africa

USA   United States of America

SAEP   South African Environmental Programme

SASA   South African School Act

SEED   Sustainability and Environmental Education

ELRC	Education Labour Relations Council
CAPS	Curriculum Assessment Policy Statement
WET	Water Education for Teachers
WESSA	Wildlife and Environment Society of South Africa

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CHAPTER 1
INTRODUCTION AND OVERVIEW

1.1   INTRODUCTION

This study is about barriers to managing Environmental Education projects in Alexandra Township primary and secondary schools. In South Africa like other countries worldwide, environmental education (EE) is viewed as an important subject that addresses environmental problems. In South Africa EE is not a stand-alone subject but an integrated subject in the latest school curriculum, the Curriculum and Assessment Policy Statement (CAPS). In teaching environmental education, EE projects are essential in bringing awareness and equipping learners, educators and the community with knowledge and skills. Unfortunately, schools in Alexandra Township are encountering barriers to managing EE projects due to various reasons emanating from political, socio and economic factors.

This chapter outlines an introduction and overview of the study. Background information of the study is presented, followed by a brief discussion on the crisis in managing EE projects in schools, the problem statement and aim of the study. The research method is also outlined. It is followed by a description of the delimitation, limitations and ethical issues of the study. Clarification of concepts, the theoretical framework and significance of the study as well as an overview of the study are also presented.

1.2   BACKGROUND OF THE STUDY

This section unfolds the background of the study. Attention was given to the global environmental crises in schools, and the need to manage EE projects in schools, the crises in managing EE projects in schools, factors causing the problem of EE project management in schools and measures used to respond to barriers to managing EE projects in schools.

Schools around the globe are engaging themselves in environmental crises occurring within their vicinity. Murwendo (2010:2) indicated that the environmental crisis is

complex and interlinked, due to the sophisticated social, political, and economic systems within modern societies. The concept of overpopulation is a contributory factor to the environmental crisis, where the resources are stressed by sheer demand on the environment due to the number of people (Lotz-Sisitka, Olvit, Gumede & Pesanayi, 2006; Tilbury, 2004). Within the South African context, and of special interest to the site of the study, that is, Alexandra Township schools in Gauteng, is the overpopulated township as well as the informal settlement along the banks of the Jukskei River.

As a result of overpopulation, schools around the world are experiencing various environmental problems such as scarcity of water (Clarke & King, 2004:13). The scarcity of water becomes a barrier in managing EE project focusing on school cleanliness or vegetable gardening projects. South Africa generates 50% of the air pollution on the African continent (CNdV Africa, 2005:16). Air pollution is a serious environmental problem in schools mostly located in townships such Alexandra in Johannesburg Gauteng province. Inadequate waste management contributes to pollution in schools (Clarke & King, 2004, CNdV Africa, 2005); sewage systems in various provinces in South Africa are failing, resulting in water pollution and potentially causing health problems to school children (CNdV Africa, 2005). Handling of waste from informal settlements is a particular problem owing to the lack of infrastructure and possibly the location of the settlement such as Alexandra Township.

Another factor contributing to the environmental crisis is HIV/AIDS, which economically and socially affects the active 25-45 year-old age bracket most, and results in the number of orphans and aged people requiring increasing government assistance, (Arndt & Lewis, 2001). Schools in South Africa, particularly in Alexandra Township have a serious need to feed children who are orphans; hence there is a need to establish a feeding scheme project in order to address this social problem.

According to Dreyer (1996:72), "a number of international meetings and conferences were convened to address the global environmental issues; such as the International Thessalonica Conference on Environment and Public Awareness for Sustainability and the Earth Summit in 1992." One of the resolutions of the United Nations Conference on Environment and Development, Agenda 21, (1992:196) was that Water

is needed in all aspects of life. The general objective is to make certain that adequate supplies of water of good quality are maintained for the entire population of this planet, while preserving the hydrological, biological and chemical functions of ecosystems, adapting human activities within the capacity limits of nature and combating vectors of water-related diseases. Innovative technologies, including the improvement of indigenous technologies, are needed to fully utilize limited water resources and to safeguard those resources against pollution. The widespread scarcity of water as well as aggravated pollution of freshwater resources in many parts of the world together with continuous encroachment of incompatible activities, demand integrated water resources planning and management. In South Africa, Alexandra Township experiences water scarcity due to increase of population. Jukskei River is highly polluted due human activities and that poses health hazards to people who are staying in Alexandra Township. Improved technology is also required in order to upgrade water supply system in schools and community at large. Building or provisioning of water harvesting systems cannot be over emphasised in schools environment that is in case there is no water supply from the municipality.

Despite the efforts made to organise these international conferences and summits and to publish reports, not enough is done by the national Department of Education (DoE) in South Africa to address the environmental crisis. For instance, EE is not a school subject in the curriculum, which diminishes the influence it is supposed to have in addressing the wide scope of environmental issues in schools. According to the Zimbabwean Journal of Sustainable Development in Africa (2010: 6), Zimbabwe's commitment to EE is reflected in the primary school curriculum, where it is taught as environmental science. This illustrates a need for schools as education vehicle to address environmental problems through EE projects.

However, in order to have EE projects, they need to be managed properly. This is endorsed by Lebeloane (2004:7) who rightly states that "…managing and protecting the environment and projects will preserve it for future generations". He further indicates that this indeed is a global concern.

Furthermore, there is a need to manage EE projects in schools to raise awareness among the school communities (learners, teachers and personal assistance staff). In

addition, EE projects can improve teacher's knowledge, understanding, skills and actions to benefit the process of teaching and learning in schools. According to Kanyimba, (2009:23), "education can then be seen as a process in which an individual's knowledge, understanding, skills and actions are enhanced to enable the individual to fully utilize such knowledge, understanding, skills and action to the benefit of themselves and others in the social, political, economic and ecological surroundings". In this study, the researcher explored EE project management of knowledge and skills that Alexandra Township school principals, educators, subject facilitators and Institutional Developmental Support Officers (IDSOs) possess.

EE projects should involve an inter-disciplinary, integrated, active approach to learning across the curriculum in order to create environmentally literate and active citizens and ensure that all South Africans, present and future, enjoy a decent quality of life through the sustainable use of resources (South African White Paper on Education and Training, 1995:7)

Consequently, there is a need for all schools to manage their EE projects in order to ensure that the present and future generations enjoy quality of life. There is a need to strive for excellence in managing EE projects in primary and secondary schools to enhance teaching and learning in the classroom. The question of addressing the need for the schools to engage with other stakeholders in order to manage EE projects should be examined globally and locally.

Agenda 21 is a non-binding, voluntarily implemented action plan of the United Nations (UN) with regard to sustainable development. It is a product of the Earth Summit (UN Conference on Environment and Development) held in Rio de Janeiro, Brazil, in 1992. It is important that the DoE should incorporate the EE projects in curriculum subjects. Schools should also have policies in EE to provide guideline to educators with regard to management of EE projects. School principals should work together with the DoE in formulating strategies that can be used in managing EE projects in schools, as illustrated in Chapter 25 on page 276 of Agenda 21.

Agenda 21 (chapter 25: 276) emphasises the need for schools to manage EE projects in a sustainable manner. In addition, they should handle the incorporation or

integration of the concepts of EE projects and sustainable development throughout curricula as an important issue. International organisations such as the World Bank Development Education Program supports the need for EE projects in schools through offering a website (www.worldbank.org) that includes learning modules and interactive material for students.

According to the Commonwealth of Australia (2009: 10), the emphasis is on developing individuals and organisations' knowledge, skills, values, capacity and motivation to respond in providing information and raising awareness on environmental issues. There is a need for schools to have individual educators, principals, subject facilitators and IDSOs who have knowledge, skills and capacity to manage EE projects in schools.

The need to manage EE is based on the fact that it provides learners with awareness and knowledge about the environment typically including the relationship of humans to the natural world, and fosters the development of the skills, attitudes and motivations to enable learners to make informed decisions and take responsible actions that incorporate environmental considerations. Canada established Earth-care Canada, which is an activity-based, curriculum-aligned EE programme for all grade levels designed to achieve environmental stewardship and sustainability through youth engagement. It focuses on energy conservation, waste reduction, and water conservation, (Thomson, 2006: 4)

There is a need for South African schools to develop a strategy that will assist school principals and educators to incorporate the concept of EE project management throughout the CAPS curriculum. The next section will address the crises in managing EE projects in schools.

1.3   CRISES IN MANAGING EE PROJECTS IN SCHOOLS

The crises in managing EE projects in schools emanates as a result of poor involvement of staff and learners. Meanwhile, poor integration of EE projects into the curriculum also results in crises in the management of EE projects. In addition, lack of organisation, resource management and poorly managed physical surroundings of the

school contribute to crises in managing EE projects (National Environmental Education Statement for Australian Schools, 2005:12).

The issue of how EE projects should be managed at school is a serious concern worldwide. In Zimbabwe, Mukoni (2013: 3-4) indicates that only 16% of educators reported that they were once involved in solving environmental problems of the community in Zimbabwe. This is a clear indication of lack of interest amongst the educators to participate in EE projects in Zimbabwe. It is reported that only 20% of the participants confirmed that they are linked with external organizations involved in the stewardship of the environment. If schools are linked to non-governmental organisations, they stand a chance of acquiring experience, knowledge and skills on how to manage EE projects (Mukoni, 2013: 3-4).

In addition, Korhone and Lappalainen (2004:13) argue that a crucial element of the active participation in EE projects is dialogue in shared experiences through which environmental conceptions are altered or made. Educators and principals can only share knowledge and experiences that they possess, but if they do not have the collaboration amongst themselves, it will just be a futile exercise.

There should be a clear overview of school operations (waste, water, energy, grounds and tuck shops), school policies, curriculum, and teaching and learning, before moving on to EE project management. When managing EE projects, it is also important to move at a rate that is compatible with the school's ability to manage EE projects and to keep the school and local community informed, so as to ensure that success is celebrated (National Environmental Education Statement for Australian Schools, 2005:17). The New Delhi Statement (adopted at the Global Consultation on Safe Water and Sanitation for the 1990s, which was held in New Delhi from 10 to 14 September 1990) formalized the need to provide, on a sustainable basis, access to safe water in sufficient quantities and proper sanitation for all, emphasizing the "some for all rather than more for some" approach. Four guiding principles provide for the programme objectives: a. Protection of the environment and safeguarding of health through the integrated management of water resources and liquid and solid wastes, Agenda 21 (1992:210). The provision of proper sanitation in schools is important in order to safeguard learner's health.

According to the findings of a survey done by Dahle and Neumayer (2001:16), some of the crises in managing EE projects in schools such as greening the school are due to the lack of financial resources. Most schools in South Africa depend on funds provided by the Department of Basic Education and no allocation is made for EE projects. This makes it difficult for schools to purchase resources required to manage EE projects. Another common crisis is the lack of awareness amongst learners, staff and the community with regard to environmental problems.

Schools are experiencing crises in managing EE project such as water scarcity due to lack of knowledge, relevant resources, plans and means of working relationship with the local authorities such as municipalities. It is essential to schools to have broad-based education programmes, with particular emphasis on hygiene, local management and risk reduction concerning sanitation. Schools should be able to effectively plan and manage water-supply and sanitation at their level, and to utilize funds most effectively, trained professional and technical staff to assist in managing water and sanitation crises. School should be able to promote primary health and environmental care including training learners and local communities in appropriate water management techniques and primary health care. It is essential to the local municipality to regularly rehabilitate water and sewage systems with the aim of the reduction of water wastage, safe reuse of water and waste water, (Agenda 21, 1992: 211).

According to section 16a of the South African Schools Act 84 of 1996, the Department of Basic Education vested the authority of school management in school principals. School principals are the key leaders in managing schools. Their lack of involvement in managing the EE projects contributes to barriers to managing EE projects in schools. A principal's role should be that of ensuring that educators, learners, parents, community stakeholders, and DoE officials become aware of and understand the importance of the EE project established in the school. The South African School Act no. 84 of 1996 further stipulates that individual schools should develop policies that govern the schools. It is the responsibility of the school principal to make sure that the school has an environmental policy. An EE policy for schools aims to guide teachers and principals in their important EE project task. It provides a framework for integrating

EE across the key subjects and introduces a positive action plan so schools can develop environmental management plans.

1.4   PROBLEM STATEMENT

According to Locke (2007:16) as cited by Crewel (2009:111), a   problem statement responds to the question: why does a researcher want to undertake a study and what does he or she hope to accomplish? A problem statement is a clear, concise description of the issue(s) that need(s) to be addressed.

Given the significance of the integration of Environmental Education in all Curriculum Assessment policy Statement subjects, in South Africa school educators are seen as drivers of EE projects in schools. School principals as managers and educators as the drivers of the curriculum are seen as key role players in managing EE projects in schools. According to UNESCO (1990:10), Goal Statement No. 22 aims at developing individual educators who have ability to organise, implement and manage EE projects. School principals and educators should develop well thought out management plans of EE projects that aim at resolving barriers to managing EE projects in schools.

Despite having the EE integrated in other curriculum subjects, the majority of South African school principals and educators isolate EE themes when teaching curriculum-based subjects and some are reluctant in initiating EE projects that are related to the themes in their subjects. Conde and Sanchez (2010:2) indicated the different ways in which environmental education can be incorporated into the curriculum. One of the models of (Pujol, 2003) is a "sword" model in which the transversal theme cuts through all the areas of the curriculum as a complement in the form of isolated activities or occasional workshops, whether internal or external to the school context. The concept of transversality referred to teaching that had to be present in compulsory education as a "guardian" of interdisciplinarity in the different areas, not in the form of isolated teaching units. Transversal themes are integrated into all areas of knowledge and the everyday life of the school. For environmental education projects to be well managed at school level, educators should be able to incorporate EE into their subjects.

The researcher in his position as a former school principal for four years and five months in Alexandra Township observed that schools have EE projects such as water scarcity EE project, sanitation EE project, vegetable garden EE project, nutrition EE project, greening EE project and recycling EE project. In schools where there are EE projects, there are several factors, such lack of knowledge, skills, human resources, funds and lack of support from internal staff and from district officials which are contributing factors resulting in poor management of EE projects in primary and secondary schools by principals and educators. This constitutes a problem in that school principal and educators do not have necessary knowledge and required skills to manage EE projects. Educators are unable to integrate EE projects in their curriculum subjects when teaching. In addition school principals do not know how projects are managed; hence they cannot provide any guidance to educators on how to manage EE projects.

The problems encountered by school principals and educators in managing environmental education projects are not being adequately addressed. Proper integration of EE into CAPS subjects will be a sign that educators are understand how to teach environmental education, hence they can easily engage themselves in managing EE projects. A key aspect is the acquisition of skills and knowledge for management of EE projects. Educators and principals should decide to do it, and secondly, are ready to resolve environmental problems. Experiences such as those described by Breiting, Hedegaard, Mogensen, Nielsen and Schnack (2009) represent important referents of progress on these issues.

In order to find supporting evidence related to the study, relevant literature was used to explore the barriers to managing EE projects, causes and possible solutions to managing EE projects in primary and secondary schools in South Africa, other parts of Africa such as Namibia and Zimbabwe, as well as Australia, Canada and the United States (US) and measures that can be used to improve the management of EE projects in schools. Educators should ultimately control the pace and direction of change and have the ability to obstruct or facilitate the process of environmental education projects in schools and also be able to mention that what they teach is influenced by their context and the lens they use, (Hebe, 2009:3-4).

Based on the above information, the following is the main aim and secondary aims of this research:

1.5 AIM OF THE STUDY

The main aim of the study was to explore barriers to managing EE projects in Alexandra Township primary and secondary schools. The other intention was to determine what school principals and educators believe to be the barriers to managing EE projects in schools. The importance of acquiring such data may inform school authorities on cultivating appropriate professional development for teachers on the management of EE projects. The data can also inform further research needs as far as EE projects management is concerned.

From this broad goal the operational goals that needed to be achieved are as follows:

- To determine the EE projects in schools
- To identify the role players in the management of school EE projects in Alexandra Township
- To determine the extent to which principals, educators, subject facilitators and IDSOs are aware of systemic and total quality management theories
- To suggest ways of improving the management of EE projects in Alexandra Township be improved.

Based on the above aims, the research question and its sub-questions were formulated as follows:

1.6 RESEARCH QUESTIONS

What are the barriers to managing EE projects in Alexandra Township primary and secondary schools?

The following sub-questions were posed to explore the main research question further.

- What EE projects are implemented by primary and secondary schools in Alexandra Township?
- Who are the key stakeholders in the management of school EE projects in Alexandra Township?
- What roles do the various stakeholders play in the management of school EE projects in Alexandra Township?
- What competencies do the various key stakeholders have regarding the management of school EE projects?
- What challenges are faced by schools in Alexandra regarding the management of EE projects?

The research question is followed by research methodology.

1.7   RESEARCH METHODOLOGY

According to Salkind (2012:47), research methodology is a group of techniques used to answer questions in a scientific manner. There is a difference between the methods and methodology of a research study. Henning (2004:36) states, "Method" is a way of doing something (one thing), whereas methodology refers to the coherent group of methods that complement one another and that have ''the goodness of fit' to deliver data and findings that will reflect the research question and suit the research purpose." Methods employed in this study include, data collection using questionnaires and through participatory observation, data analysis, discussion, interpretation and synthesising and summarising findings.

In this study, research methodology is regarded as a systematic process of inquiry by gathering information through the use of scientifically acceptable methods to analyse, interpret and give meaning to phenomena. It facilitates better understanding of produced information (Creswell, 2003: 104-10).

Research can be approached qualitatively, quantitatively or by means of mixed method research. Creswell (2009:203) indicates that mixed method research employs the combination of qualitative and quantitative approaches. This approach is characterised by the use of multiple methods of enquiry, it is convenient to use for the

research problems that incorporate the need both to explore and explain, it follows a purpose statement and research questions focused on understanding a problem using both qualitative and quantitative data, and it advances the reason for using multiple forms of data collection and analysis. Aliaga and Gunderson (2000:3), describe quantitative research as explaining phenomena by collecting numerical data that are analysed using statistics. Quantitative research is essentially about collecting numerical data to explain a particular phenomenon, and particular research questions seem immediately suited to being answered using quantitative methods. McEwan and McEwan (2003:79) state that "qualitative researchers are focused on explaining and interpreting what they observe, hear and read". Qualitative research is different from quantitative research because it does not focus on numerical variables and values.

The qualitative method was regarded as the most suitable method to realize the aim of this study, namely to explore barriers to managing EE projects in Alexandra Township primary and secondary schools. The process in which the empirical study took place will be discussed further in the next section.

1.7.1   Research paradigm

A research paradigm is a frame of reference for conducting research. It forms part of the research methodology. There are many paradigms which could be used to conduct research. They include, among others, Africanism, critical social theory, feminism, interpretivism, positivism and many others (Denscombe, 2002:17; Brown & Baker, 2007:34; Nudzor 2009:3). These could be defined, characterised and contextualised for a particular research study.

Interpretivism is regarded as the appropriate paradigm of this research study. It maintains that the worldview around us is the creation of the mind, and that we can only experience the world through our personal perceptions which are coloured by our preconceptions and beliefs. This paradigm is represented by a diversity of approaches, namely: constructivism, symbolic interactionism, ethnomethodology, and phenomenology. Interpretivism is grounded in a strong emphasis on exploring the nature of particular educational phenomenon rather than testing hypotheses and a tendency to work with unstructured data (data that has not been coded at the point of

collection). In addition, it also pays attention into investigating a small number of cases in detail and employing explicit interpretations of meanings and functions of human actions which take the form of verbal descriptions and explanations. And lastly, the interpretivist paradigm is very much concerned with issues of subjectivity, which is what this study is grounded in. The interpretivist paradigm is, in this study, concerned with school principals, educators, subject facilitators and IDSOs' perceptions, attitudes and interpretations regarding the management of EE projects in schools. That is elaborated on later in this study (1.12 and chapter 4).

The discussion in the subsequent paragraph deals with the research design of the study.

1.7.2   Research design

According to Leedy (2003:91), the research design refers to the complete strategy of attack on a central research problem. It provides the overall structure for the procedures that the researcher follows, the data that the researcher gathered and the data analysis that the researcher conducted. McMillan and Schumacher (2010:20) describe research design as procedures for conducting research in the study. The aim of a research design is to specify a plan to enable the researcher to generate empirical evidence that will be used in answering the research questions.

This study took a qualitative approach using qualitative methods in natural settings, framed within an interpretive paradigm (De Vos, Strydom, Fouché & Delport, 2011:325; Creswell, 2007:212; Smith & Shepard, 1988:310) in order to acquire meanings from school principals, educators, subject facilitators and IDSOs' experiences of the barriers to managing EE projects in Alexandra Township primary and secondary schools. Qualitative approach rests on the assumption that knowledge is socially constructed as individuals are inclined to understand and make meaning of the world they live in. Another important characteristic of qualitative approach is that the inquiry occurs in a natural setting while behaviour is being studied as it happens (De Vos et al., 2011:65).

According to Yin (2014:16), a case study is an empirical inquiry that investigates a contemporary phenomenon ('the case') in depth and within its real-world context especially when the boundaries between the phenomenon and context may not be clearly evident. This study employed a single case study design. The case study strategy was chosen as the relevant research type for providing the required information pertaining to the research questions and to develop a full understanding of management of environmental education projects in schools. McMillan and Schumacher (2010: 344) and Babbie (2010:309) describe a case study as an in-depth examination or analysis of a single instance of some social phenomenon.

In this case study individual school principals and educators have been chosen as the participants. They were selected because they manage environmental education projects and are instrumental in realising the benefits in attaining desired EE projects outcomes. In this study the above indicated participants are considered to be rich in information with regard to managing EE projects. The information gathered from school principals, educators, subject facilitators and IDSOs was used by the researcher in exploring barriers to managing EE projects in Alexandra Township primary and secondary schools.

Lichtman (2010:5) describes qualitative research as a form of collecting data with the aim of interpreting the information from the human in full contact with the participants, which involves in-depth interviews, observation and documents analysis. The research involved participatory observation which gave him the opportunity to have full contact with the participants. In this empirical study, the researcher observed that reality is subjective: it resides in people and is constructed by people who experience it (Creswell, 2007:15-30). This motivated the researcher to systematically solicit different views and meanings from school principals, educators, subject facilitators and IDSOs who have lived experiences in managing EE projects in schools.

In this study, qualitative research was conducted in a natural setting which is Alexandra Township. The researcher was the key instrument in the process of collecting qualitative data. Data was collected from multiple data sources before it was analysed inductively.

Qualitative research was used in this study to interpret the meanings that school principals, educators, subject facilitators and IDSOs attach to the concept 'EE project management'; to interpret the extent to which they manage EE projects; to describe barriers, causes and possible solutions to managing EE projects; and how subject facilitators and IDSOs offer support to schools.

1.7.3   Population and sampling

Babbie (2010:199) and McMillan and Schumacher (2010: 129) describe population as a group of elements, cases or individuals that conform to specified criteria and to which researchers intend to generalise the findings of the research. The research population for this study was school principals, and educators from Alexandra Township primary and secondary schools, and the subject facilitators and IDSOs from Johannesburg East District. However, cognisant of the constraints of time, resources and the impossibility of engaging all schools, the researcher used his judgment to identify and select accessible principals and educators in terms of the location of the school and the time scheduled for answering open-ended questionnaire and conducting participatory observation.

Corbetta (2003: 211) refers to sampling as a "procedure through which we pick out, from a set of units that makeup the subjects of study" The term 'sampling strategy' used in this study refers to the way or manner in which individuals or participants were selected from the population. Sampling is defined as an act, process, or technique of selecting a suitable sample, or a representative part of a population for the purpose of determining parameters or characteristics of the whole population. A sample is a finite part of a statistical population whose properties are studied to gain information about the whole (Webster, 1985). When dealing with people, it can be defined as a set of participants (people) selected from a larger population for the purpose of a survey. The analysed collected data from the sampled population can represent the larger group. The participants were sampled because they were found to have certain attributes relevant to the phenomenon in that they were involved in (the EE project management in different portfolios) as suggested by Cohen et al. (2000:103)

Sampling is categorised into probability sampling and non-probability sampling (David & Sutton, 2004:150- 152). In this study the researcher made use of the non-probability sampling and purposive sampling. Non-probability sampling is a technique wherein the samples are gathered in a process that does not give all the individuals in the population equal chances of being selected. It can be used when demonstrating that a particular trait exists in the population; when the researcher aims to do a qualitative and exploratory study; when the researcher does not aim to generate results that will be used to create generalisations pertaining to the entire population; and when the researcher has limited budget, time and workforce. There are five types of non-probability sampling, namely: convenience, sequential, quota, judgmental, and snowball sampling. Babbie (2010:93) defines purposive sampling as a form of non-probability sampling in which units to be observed are selected on the basis of the researcher's judgment about which ones are the most useful or representative. Based on the research's judgement, the schools that were chosen for this study are those that have environmental education projects and school principals together with educators are involved in managing EE projects.

Amongst the five types of non-probability sampling, the researcher made use of convenience sampling. With convenience sampling, the samples are selected because they are accessible to the researcher. Subjects are chosen simply because they are easy to recruit. This technique is considered easiest, cheapest and least time consuming, (Mizner, 2016: 1). Considering time factor and distance, the researcher easily accessed the school principals, educators, subject facilitators, and ISDOs from the DoE in Johannesburg east district since at the time of the study he was also working under Johannesburg east district. In this study, convenience sampling was easiest, cheapest and least consuming since all the sampled participants worked in Alexandra Township schools where the researcher was working as a school principal.

Polit and Hungler (1999:43, 232) define a population as the totality of all subjects that conform to a set of specifications, comprising the entire group of persons that is of interest to the researcher and to whom the research results can be generalised. A research population is also known as a well-defined collection of individuals or objects known to have similar characteristics. Polit and Hungler (1999:278) state that,

"eligibility criteria specify the characteristics that people in the population must possess in order to be included in the study".

The population sampled in this study were 19 school principals, 19 educators, 5 subject facilitators and 5 IDSOs from Alexandra Township, Johannesburg East district, Gauteng province. The rationale for choosing these schools was that they have environmental education projects. The population was relevant to the study since they deal directly with EE project management in schools and they are educators and district officials who oversee the management of EE projects in schools. This notion is also supported by Cohen and Morrison (2002:27) who indicate that a population is a group of respondents from whom the researcher will gather data, analyse and interpret it then make the results to be known. In contextualising the preceding description for the study, the population constituted a case study which, according to the researcher, was appropriate to provide relevant information regarding the management of EE projects in schools in order to answer the main research question and the subsidiary questions as indicated in section 1.6.

1.7.4   Data collection techniques and analysis

Creswell (2007:118) states that data collection comprises of interrelated activities aimed at gathering relevant information to answer research questions. Qualitative techniques were used to collect data. In this study it included the use of open-ended questionnaires and participatory observation. Participants are to provide answers in their own words. According to Pope and Mays (2000:10), open-ended questions have the ability to evoke responses that are meaningful and culturally salient to the participant; unanticipated by the researcher, rich and explanatory in nature. The researcher made use of the open-ended questionnaire in order to gather data from respondents and incorporate it with information gathered during participatory observation. That was done as part of gathering true reflection of the meaning on barriers to managing EE projects in Alexandra Township schools.

The most common tool that qualitative researchers use to collect data is observing people in their natural territories (Bogdan & Biklen, 2002:57). The researcher visited participants in their natural territories (schools) to observe the management of EE

projects. Before the empirical investigation, the researcher conducted a literature study on barriers to managing EE projects in South African schools. The literature study further included relevant examples from two countries on the African continent, which were, Namibia and Zimbabwe and it further looked at examples of barriers to managing EE projects in schools in the US, Australia and Canada. The literature review was followed by an empirical investigation whereby open-ended questionnaires and participatory observation were used to collect data from participants.

The researcher conducted a qualitative pilot study to pre-test or trial run the data collection Instrument (questionnaire), and improves reliability (Marshall & Rossman, 2011; 1999:64) at one of the primary schools which was also part of the sampled schools and also one subject facilitator and IDSO from Johannesburg east district. As part of piloting the questionnaire, the researcher went to observe existing EE projects in schools and recorded the information.

In qualitative research, collected data is analysed using the systemic classification process of coding and identifying themes or patterns (Hsieh & Shannon, 2005:1278). In this study collected data was analysed by means of bringing together similar data (coding) within the same scope of concepts and themes were created using the questionnaire and interpreted in a comprehensive way. Other data collected from participatory observation and literature studies were analysed according to the categorised themes.

1.8 DELIMITATIONS, LIMITATIONS AND ASSUMPTIONS OF THE RESEARCH STUDY

The delimitations are those characteristics that limit the scope and define the boundaries of the study. The delimitations section of the study will explicate the criteria of participants to enrol in the study, the geographic region covered in the study, and the profession or organizations involved, (Simon, 2011:2). Participatory observation was regarded as delimitation of the study, since it has limited the scope of gathering more data.

Simon (2011:3) indicates that limitations are potential weaknesses in the study and are out of your control. If you are using a sample of convenience, as opposed to a random sample, then the results of the study cannot be generally applied to a larger population, but only limited population. This study applied convenience and purposive sampling technique limited to Alexandra Township primary and secondary schools. The research was limited to thirteen primary schools and six secondary schools public primary and secondary schools situated in Alexandra Township Johannesburg east district in Gauteng province. Subject facilitators and IDSOs from Johannesburg east district also constituted part of respondents of the research project. That is, a total of nineteen school principals, nineteen school educators, all from Alexandra Township primary and secondary schools as well as five subject facilitators and five IDSOs participated as respondents in the research study.

Simon (2011:1) states that assumptions in the research study are things that are out of the researchers' control, but if they disappear the study would become irrelevant. If a person is conducting a survey, assumptions are that people will answer truthfully. If a researcher is identifying and choosing a sample, the assumption is that the sample is a representative of the population one wishes to make inferences to. Leedy and Ormrod (2010:62) posit, "Assumptions are so basic that, without them, the research problem itself could not exist." In sampling the participants the researcher assumed that school principals, educators, subject facilitators and IDSOs will truthfully answer questions in a way that they will represent the population from which inferences will be drawn. The convenience and purposive sampling of schools, the principals and educators thereof was informed by the researcher's personal assumptions which are listed as follows:

- The schools have environmental education projects
- Educators are integrating EE in their subjects
- School principals and educators are involved in managing the EE projects
- Other stakeholders who are involved in the management of EE projects include the IDSOs and Subject facilitators.

1.9   ETHICAL ACCEPTABILITY AND CONSENT

In conducting any type of research such as qualitative research, the researcher is expected to ensure that the ethical issues are taken into consideration. Scheyvens, Nowak and Scheyvens (2003: 140) explain that "ethical considerations do not determine how successful the researcher will be but rather whether the research is just or not and the extent to which the research takes the participants' needs and concerns into account". In this study, ethical considerations are viewed as all the measures that are taken by the researcher to ensure that the acceptable rules of conduct are followed and the following ethical considerations were applied. Ethical issues include, among others, confidentiality of the respondents' personal information as well as the information they provide, reliability and validity of information. These should be in line with the type of research which is conducted and the respondents, who are in this case the school principals, educators, subject facilitators and institutional development support officers. The researcher has to ensure that respondents remain anonymous to protect their identity; their rights and the welfare (Refer to appendix 3).

As part of adhering to ethical issues, the researcher has to invite potential participants, brief them about the research they are conducting and the roles of respondents. Their concerns are also addressed to put everyone at ease (Strauss & Myburgh 2003:61). As part of adhering to ethical issues for this study, the researcher firstly sought permission from the Gauteng DoE to interview and collect data from the respondents (Refer to appendix 1). The Gauteng DoE gave the researcher consent to conduct research (Refer to appendix 2). Potential respondents were invited and briefed about the research project. They were also given opportunities to air their views with regard to concerns such as their confidentiality (participant's details and anonymity), confidentiality of the school's names and commitment not to interrupt the normal teaching and learning periods of the school. All those were addressed. The school principal together with the school governing body chairperson gave permission with regard to photographs of learners, as long as their faces will be hidden. Honesty and trust in all actions have been embraced to avoid deception, thereby restoring a sense of equality between the researcher and participants; risks to participants was

minimised by ensuring that research procedures do not unnecessarily expose them to risk.

1.10   TRUSTWORTHINESS

Qualitative research methods are designed to guarantee that the same data and methods give the same conclusions (objectivity). Validity and reliability measure trustworthiness of the research. Reliability is the consistency of a set of measurements or measuring instrument (Rasila, 2007:1). As viewed by Merriam (2001:166), the truth value or internal validity and the transferability or external validity is the extent to which one's findings match reality. The researcher ensured that data collecting instruments are reliable and the results are valid and can be considered to be the truth and applicable in similar context somewhere else, (Babbie, 2010:150-153).

Based on the different worldviews (paradigms), reliability and validity are considered relevant in qualitative studies where the concepts used to denote rigour and trustworthiness are credibility, transferability, dependability and confirmability (Given, Winkler & Willson, 2014:9; De Vos, 2011:419- 421). In this study, the technique for ensuring rigour and trustworthiness included preliminary visits to schools and IDSOs offices respectively by the researcher to familiarize himself to school principals and teachers as well as IDSOs in order to establish relations of trust. That was followed by a selection of research participants who could provide appropriate data to answer the research questions. The researcher also piloted the open-ended questionnaire and improved it for gathering information during participatory observation of EE projects in schools.

1.11   CLARIFICATION OF CONCEPTS

The following key concepts were identified and defined with specific reference to this study: barriers; education; environmental, managing; primary and secondary schools; projects.

1.11.1 Barriers

According to Merriam-Webster's Learner's Dictionary, a barrier is considered as something that makes it difficult for people to understand each other or a law, rule, problem, that makes something difficult or impossible, something that prevents or blocks movement from one place to another (Webster, 2016:1).

Rickinson (2004:21) stated the following as barriers to EE outdoor learning activities in schools, namely: the concern for children's safety and the legal liability associated with potential risks; confidence and level of expertise impacts not only teacher choices as to what to teach, but also how to teach the content and how well they can teach the content; physical barriers such as time, resources, and support are amongst barriers; students to staff ratio, course structure, school day schedules, and school budgets restrict the teaching of action-based (projects) environmental education.

1.11.2 Education

Kanyimba, (2009:23) maintains that "Education is then defined as a process in which an individual's knowledge, understanding, skills and actions are enhanced to enable the individual to fully utilize such skills to the benefit of themselves and others in the social, economic and ecological surroundings". According to Yero (2002:1) education is defined as a process of developing the knowledge, skill, or character of individuals with the aim of teaching individuals rather how to think, than what to think, rather to improve their minds, so as to enable them to think for themselves, than to load the memory with the thoughts of other men. Merriam-Webster's Learner's Dictionary, defines education as the action or process of teaching someone especially in a school, college, or university the knowledge, skill, and understanding in a particular field of study on how to solve problem, (Webster, 2016:2).

In this study education is viewed as the process that empowers school principals, educators, subject facilitators and IDSOs with management knowledge and skills on how to manage EE projects.

1.11.3 Environmental education

According to Toth (2013:1), environmental education (EE) connects us to the world around us, teaching us about both natural and built environments. EE raises awareness of issues impacting the environment upon which we all depend, as well as actions we can take to improve and sustain it.

EE is not a form of education among many others; it is not simply a tool for environmental problem-solving or management. EE should rather be seen as an essential dimension of basic education that lies at the root of personal and social development: the sphere of relationships with our environment, with our common home of life (Sauvé', 2002:1)

The National Environmental Education Policy Act (U.S. Public Law 91-516, 1969:1) states "For the purpose of this Act, the term 'environmental education' means the educational process dealing with man's relationship with his natural surroundings, and includes the relation of population, conservations, transportation, technology, and urban and regional planning to the total human environment".

Mukoni (2004:21) indicates that EE is an interdisciplinary and holistic form of education that is geared towards action and change, which promotes the use of participatory learning, learning by doing and action based methodologies. EE includes the varied learning processes that provide opportunities for people to learn knowledge, skills, and attitudes that enable them to act out within their community in an environmentally responsible way.

1.11.4 Primary and secondary schools

The South African School Act no.84 of 1996 describes the concept primary school as a government public school in which children receive primary education from the age of about five to eleven, coming before secondary school and after pre-school. It is the first stage of compulsory education and is normally available without charge, but may be offered in a fee-paying independent school. A secondary school refers to a high school or senior high school with children between ages of 11 to 19.

1.11.5   Project management

Project management is the discipline of planning, organising, motivating, and controlling resources to achieve specific goals. Project management is the application of processes, methods, knowledge, skills and experience to achieve the project objectives. A project is a unique, transient endeavour, undertaken to achieve planned objectives, which could be defined in terms of outputs, outcomes or benefit (Robert, 2014:1).

Kerzner (2003:73) defines projects as any series of activities and tasks that have a specific objective to be completed within specifications; have defined start and end dates; have funding limits; consume human and nonhuman resources and are multi-functional. In addition, he also indicated that project management involves project planning, definition or work requirements, quantity and quality of work and of resources needed; and project monitoring, including tracking progress, comparing actual outcome to predicted outcome, analysing impact and making adjustments.

In this study a project management is an approach to EE projects that require planning and guiding project processes from start to finish. This study seeks to find out if principals and educators do follow the five stages in project management, namely: initiation, planning, executing, controlling, and closing when managing EE projects. The researcher intended to find out the method, knowledge, skills and experiences that principals, educators, subject facilitators and IDSOs have in order to manage EE projects in Alexandra Township primary and secondary schools.

1.12   THEORETICAL FRAMEWORK

Total quality management theory and systemic management theory are the learning theories that endorse the use of systems in managing educational projects in schools. Although these two learning theories are different, they share similarities in educational management to enable school principals and educators to manage EE projects.

Total quality management theory calls for the use of systematically collected data at every point in a problem-solving cycle - from determining high-priority problems, through analysing their causes, to selecting and testing solutions (Juran, 1974: 22.1-28.1; Ishikawa, 1985: 104-105; Deming, 1986: chap. 8). TQM provides a historically unique approach to improving organizational effectiveness, one that has a solid conceptual foundation and, at the same time, offers a strategy for improving performance that takes account of how people and organizations actually operate (Wruck & Jensen, 1994).

In this study, quality management is viewed as ultimately the responsibility of top management of the school. Senior managers (school principals) create the organizational systems that determine how EE projects are managed and the quality-improvement process must begin with management's own commitment to total quality.

Fowler (2009:3) indicates that systemic management is a specialized process of pattern-based decision-making that avoids the inconsistency, subjectivity and error in management practices. The use of systems in schools by principals is commendable in order to make decisions that avoid barriers to managing EE projects. Employees' work effectiveness is viewed as a direct function of the quality of the systems that managers create (Juran, 1974: 21.1-21.4; Ishikawa, 1985: 122-128; Deming, 1986: 248-249).

In addition, Fowler (2009:10) states that management involves what we do, our action, and our objectives or policy. Specifically, management involves human action, objectives and policy. Management questions often involve similar words but always with the element of 'should'. School principals and educators should understand their EE policy, their involvement, their actions and set objectives of managing EE project. They are expected to put systems in place that will ensure pattern-based decision-making that avoids the inconsistency, subjectivity and error in management practices. The theoretical framework that underpins this study was discussed in chapter 4.

1.13 THE SIGNIFICANCE OF THE STUDY

The significance of this study is to explore school principals, educators, subject facilitators and IDSOs' knowledge and experience in managing EE projects in schools. The study seeks to explore, describe and analyse the perceived principals and teacher's knowledge and skills towards managing EE projects in schools, and the role of stakeholders and their competencies in helping schools to manage EE projects, as well as the challenges that are faced by schools in managing EE projects.

The significance of the problem is therefore directed at analysed the research findings, and making conclusions and recommendations to ensure acceptance and adoption of the management of EE projects in schools. The findings may also be used for professional development of school principals, educators, subject facilitators and IDSOs regarding management of EE projects in primary and secondary schools in South Africa.

1.14 OVERVIEW OF THE STUDY

This dissertation is divided into seven chapters:

Chapter 1 provided an introduction and overview of the study. Chapter 2 focused on describing the research site, namely, Alexandra Township with a focus on the historical background and its socio and economic environmental problems. Chapter 3 focused on literature dealing with barriers in managing EE projects in schools. Chapter 4 focused on the theoretical framework of the study. A research designs were employed in chapter 5 to explore the barriers to managing EE projects in schools. In Chapter 6 data was analysed and findings were presented. A summary of findings, recommendations and conclusions of the study were presented in chapter 7.

1.15 CONCLUSION

The study examined the experience of school principals, educators, subject facilitators and IDSOs in managing EE projects in schools and the aim of this chapter was to give a brief background on the crises in managing EE projects and outlined the problem

statement, aim of the study, together with research methodology. This chapter also covered the research design. Other components of the research method discussed include how data were collected and analysed and validity, reliability and ethical considerations. The chapter concludes with the delimitations, limitation, assumptions of the study, ethical acceptability and consent, trustworthiness of the study, the clarification of concepts, overview of the study and conclusion.

Chapter two focuses on contextual understanding of Alexandra Township.

CHAPTER 2
CONTEXTUAL BACKGROUND OF ALEXANDRA TOWNSHIP

2.1 INTRODUCTION

Chapter 1 provided an overview of what the study is about, namely, to explore barriers to managing EE projects in Alexandra Township primary and secondary schools. This chapter presents a contextual understanding of Alexandra Township, the research site of this study. The location of the research site, its historical background and the challenges in relation to environmental problems are outlined.

2.2 LOCATION OF THE RESEARCH SITE

According to the World English dictionary (2014:01), a research site is a physical location or a place at which a researcher gathers information for a study. In this case, the research site of this study was Alexandra Township in Johannesburg, Gauteng province in South Africa. Here information was sourced out from school principals, educators and the Johannesburg East District subject facilitators and IDSOs. Moreover, the researcher conducted participatory observation wherein field notes and photographic pictures relevant to the study were taken as part of sourced information from Alexandra Township primary and secondary schools.

The below South African map indicates the location of Alexandra Township in Gauteng province. Alexandra Township is located between 26°6.23′S 28°5.77′E. From the Greater Johannesburg Metropolitan Council report, dated September 27-30, 2000, it emerged that that Alexandra Township covers an area of over 800 hectors (including east bank). There are an estimated 20,000 shacks of which approximately 7,000 are located in "backyards". There are only 13 primary schools and 6 high schools which are public schools.

The above information was supported by Wilson (2012:6), who stated that, the Alexandra Township is located in the north-eastern suburbs of Johannesburg. Alexandra Township lies next to some of the wealthiest areas of Johannesburg, making the severe poverty and deprivation in the township a stark contrast to the

wealth of Sandton just 3km away. While many townships are huge and located far from urban centres, Alex is just over 800 hectares, or 1 square mile, or 7.6 square kilometres and is very well located being close to the centre of Johannesburg and near to main travelling routes. In this 1 square mile area we find approximately 350 000 people. 70% of this population is estimated to be under 35 years of age (the official South African higher limit for the category 'youth').
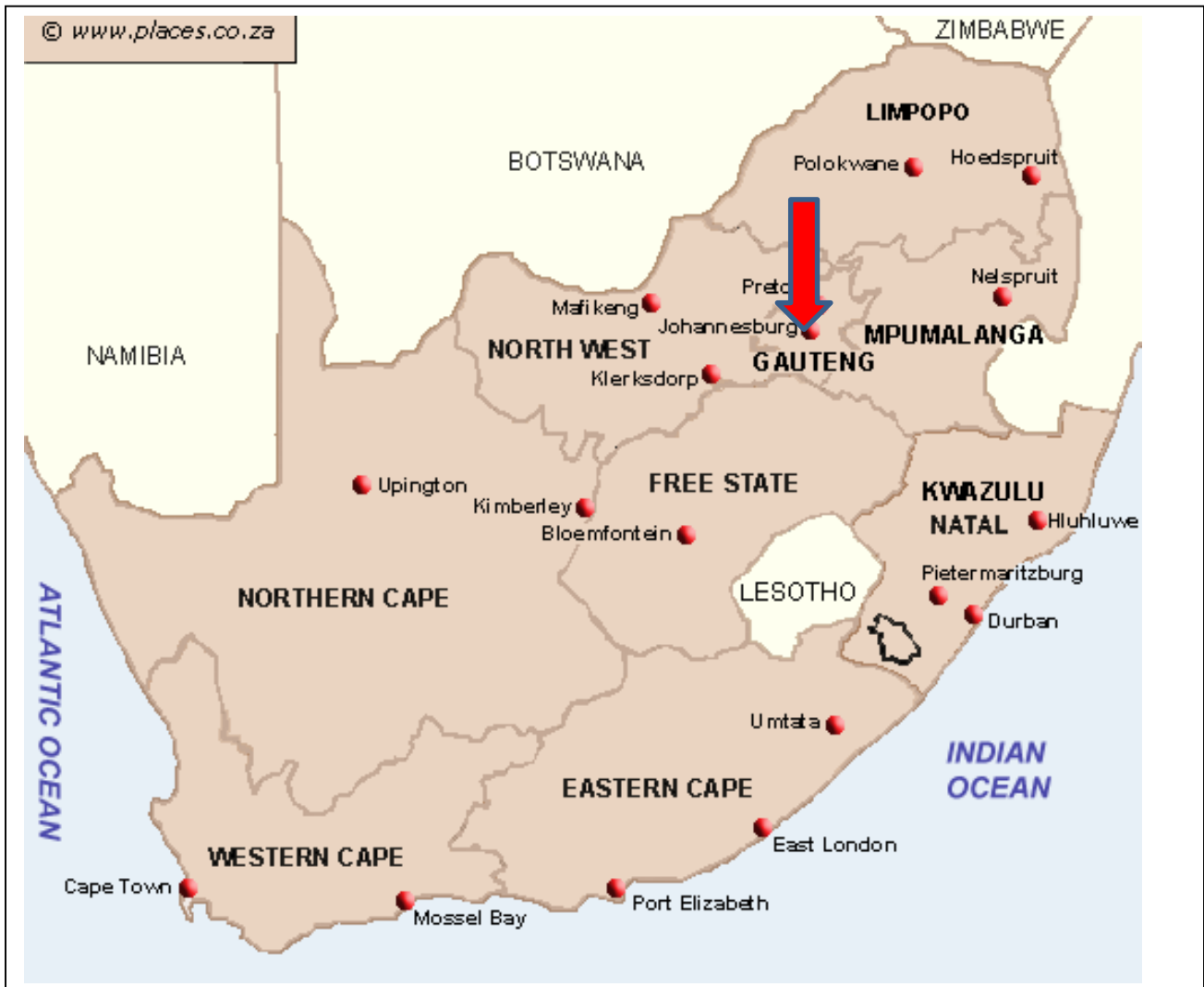
Figure 2.1: South African Map. http://www.places.co.za/html/visualfind.html

Next section describes the historical background of Alexandra Township.

2.3 HISTORICAL BACKGROUND OF ALEXANDRA TOWNSHIP

The purpose of outlining the historical background of Alexandra Township in this study is to identify the origin of social and economic environmental problems that schools encounter today, which form barriers to managing EE projects.

Alexandra Township was a native township that was established 1912. On this piece of land Mr Papenfuss, who was a farmer and the owner of the land in 1904 had the idea of establishing a suburb and naming it after his wife, Alexandra. His idea could not materialise since the area was considered to be too far from the centre of Johannesburg and there was no demand for land, as such before the publication of Native Land Act in 1913 to prevent black people from owning land in urban areas in South Africa. Thus, Alexandra Township became the area where black people could buy and own land under free title (Morris, 2000:17)

According to Ladd (2007), a township is the land formally allocated to hosting the site of a town. In South African context, a township may either be a Black residential area or an industrial site. The White government which started as early as 1910 when General Louis Botha became the first Prime Minister established townships such as Alexandra Township in 1912 in South Africa. These were endorsed by the passing of the Land Act of 1913. The Group Areas Act of 1950 further exacerbated racial discrimination in that "Black" Africans, "Coloured" (mixed-race), and "Indians" people were ordered to live separately. Although they lived together in Alexandra Township until in the 1970s when they were forcefully separated by the apartheid government into different townships such as Soweto (an acronym for "South Western Townships") and Rabie Ridge, they attended separate schools.

Primary and secondary schools which were established as early as the 1930s and 1940s in Alexandra Township and were taken over by the apartheid government remain poorly resourced. As such, they were classified by the African National Congress government as quintile 1 and 2 schools. That is, they are non-fee paying schools since majority of the learners in those schools come from poor family backgrounds. Most parents of those learners are unemployed. As part of alleviating that challenge, the government established a national school nutrition programme.

In the Alexandra Township, Johannesburg Nelson Mandela was exposed to the poverty, deprivation and brutality of black urban life. He described Alexandra as a place where life was exhilarating, it could fairly be described as a slum. The roads were unpaved and dirty, and filled with hungry, undernourished children scampering around half naked. The air was thick with the smoke of coal fires in tin braziers and stoves. A single water tap served several houses. Pools of stinking, stagnant water full of maggots collected by the side of the road. Alexandra was known as the 'Dark City' for its complete absence of electricity (Nelson Mandela Foundation Visitors' Guide, 2015: 19).

Based on the observation of the researcher as school principal in Alexandra Township, it is evident that the same socio-economic problems that Nelson Mandela outlined still prevail. Most learners attend school undernourished and without proper school uniforms. Alexandra Township schools established an EE project to feed learners in order to address this socio-economic environmental problem. Furthermore, there is the problem of poor water pressure in schools and households due to the high population density. This impacts negatively on the cleanliness of learners' school toilets and classrooms. Dumping of waste in the sewage pipe creates blockages that result in an unhealthy smell and high level of water pollution in rivers and surrounding school environment.

Next is the socio-economic environment of Alexandra Township.

2.4   SOCIO-ECONOMIC ENVIRONMENTAL PROBLEMS IN ALEXANDRA TOWNSHIP

According to Nell, Meintjies, Gordon, Campbell, Andrews and Heyns (2009: 6), President Jacob Zuma, in one of his first addresses on becoming President of South Africa highlighted the importance of Townships in South Africa today: "Our townships need to have proper shopping facilities, proper roads, electricity, water and sanitation, quality schools and clinics, affordable public transport and all the basic services that are taken for granted in historically white areas. "We will not rest until that happens." Opening of the "Pan African Shopping Centre" in Alexandra Township, 24 May 2009.

The socio-economy of Alexandra is described by Zuma as something that needs urgent attention from the government, since there is crises of facilities such as roads, electricity, water and sanitation, quality schools and clinics, and affordable public transport. Amongst the indicated needs, schools are also exposed to the crises of water scarcity and the problem of sanitation which imposes serious health hazards to learners.

According to Suzuki (2003:10), the rate of population growth and use of the earth's (natural) resources led to a decline in the capacity of the earth's systems to continue to support human needs; this is also true of Alexandra Township. The term socio-economy is this context implies the alleviation of poverty, providing affordable housing, improving employment and economic opportunities, addressing environmental concerns and providing access to services and programs that can assist individuals and groups to improve their personal circumstances (Restakis, 2006:8).

The socio- economic environmental problems in Alexandra Township include:

- High population density that has overloaded the infrastructure such that water pressure in schools and households are low and sewers frequently block and overflow. Alexandra Township contributes to socio-economic problems such as lack of employment, increase in crime rate and children suffer malnutrition.
- High density population also resulted in the development of informal settlements on the Jukskei river banks and its three tributaries which pass through Alexandra Township. The backrooms around the schoolyards created limited space for the expansion of schools. There are an estimated 7,500 households living in these areas at very high densities with poor services, poor environmental conditions, and in danger from flooding; the informal areas built on the riverbanks and tributaries are not connected to the formal waterborne sewerage system;
- Surrounding school yards and the gullies are choked with garbage as a result of land pollution; and

- The tributaries are substantially blocked and the grey water plus household refuse are discharged to waterborne sewage which leads to blockages and pollution of water in the river.

The above illustration of Alexandra socio-economic background was further alluded by Nell, Meintjies, Gordon, Campbell, Andrews and Heyns (2009: 11) who indicated that, Alexandra has a long history of poverty and overcrowding. The unemployment rate (using a conservative definition which includes only those actively looking for work) for Alex is 32%, which is higher than that for Africans in Gauteng more generally (29%). 40% of 12 women are unemployed compared to 19% of men. For those who are employed, most work in low-skilled or semi-skilled jobs.

The following photographs depict the area of Alexandra Township. The rationale of displaying these photographs is to give an understanding of what Alexandra Township looks like and to highlight some socio-economic environmental problems as outlined by Suzuki (2003:10).

Figure 2.2: Aerial photograph of part of Alexandra Township settlement in Johannesburg www.alexandratownshipaerialphotograph (accessed on 2014.04.21)

According to Sarakinsky (1984:13) Alexandra Township excluded from the general provisions of the 1913 native land Act. Section 8 (1) (i) of the Native Land Act exempted the existing of Native Townships such as Alexandra from the provisions for the prohibitive clauses of the Act (2). The Native Trust and Land Act of 1936 prevented any development or establishment of the native township such as Alexandra. Based on this Act, the government was reluctant to take heed of the administrative and municipal responsibilities for the Township. The rapid influx of black people in Alexandra Township seeking employment in Johannesburg resulted in the passing of laws such as Influx Control and the Pass Law. However the above laws could not stop the movement of blacks into Alexandra. Large numbers of people remained unemployed, catalysing conditions of poverty, extreme overcrowding, sanitation problems, scarcity of water, dumping of rubbles all-over, water pollution and air pollutions remained critical environmental issues in Alexandra Township, (Mathee, Barnes & de Wet, 2000).

2.4.1   Overcrowding

Alexandra Township is characterised by overcrowded population and the dwellings that are small and located in close proximity to each other. The backyard rooms are as a results of rural depopulation, people seeking jobs in towns and cities of Johannesburg. 63% of both formal and informal dwellings in Alexandra were reported to be one-roomed dwellings (CASE 1998). Parents who are migrating to Alexandra Township come with their children at any time of the year, which also play a role in overcrowding of learners in classroom. In each backyard room, parents and learners sleep, cook, and used as sitting room. The condition becomes unhygienic, since learners can easily transmit diseases to one another, (Mathee, Barnes & de Wet, 2000).

2.4.2   Sanitation

Negligence of sanitation in Alexandra has detrimental effects to both parents and learners. The observation indicate that human faecal is being neglected more especially alongside the Jukskei River, since most of the backyard residents do not have toilets. This exposes elder people, more especially learners to an environment

that is highly contaminated and containing a wide range of disease-causing pathogens. In order to protect public from this health hazardous environment, it is essential that faeces be removed from the living environment as quickly and effectively as possible (Von Schirnding, 1993). Sanitation systems currently found in Alexandra include flush toilets, pit latrines, bucket latrines and chemical (portable) toilets (Census 1996).

According to statistics South Africa (2011), 81% of the households in Alexandra Township have access to flush or chemical toilets, while 1% of them use pit latrines and approximately 15% use the bucket latrine system. The bucket system is much used in the informal settlement such as Stjwetla located alongside Jukskei River. A 1997 survey showed that in some part of Alexandra, up to 120 people were using a single toilet. The lack of water supply into the backyards and the informal settlement such as Stjwetla promote the unhygienic situation, parents and learners hardly wash their hands after using the basket latrine system, and this exposes them diseases such diarrhoea.

The sewer system is un-upgraded. In terms of bulk infrastructure, the sewer system in Alexandra, having been designed originally for a population of around 30 000 people, and is currently serving a population of around 150 000, is inadequate. The inadequacy and degradation of the sewer system constitutes a major environmental and public health problem. Challenges faced in addressing the problem include the erection of dwellings over sewer maintenance points, and the development of settlements within the flood lines for the Jukskei River and in public open space areas, (Mathee, Barnes & de Wet, 2000).

2.4.3   Air pollution

The use of electricity in Alexandra Township increase due to increase in number of people residing in the back yards to an extent that, people had to find other options of keeping themselves warm more especially during winter season, such as burning coal. This situation exposed young and old into in-hailing polluted air which resulted in respiratory diseases. According to (Von Schirnding,1991), health hazards of being exposed to polluted air are serious diseases such as asthma, bronchitis, pneumonia,

emphysema, lung cancer, and even death in severe cases, as well as ill health conditions such as shortness of breath, coughing, red or sore eyes, sore throat, running nose and some allergies.

According to Mathee, Barnes & de Wet (2000), In South Africa, particularly in Alexandra Township, large numbers of people living in informal settlement such as Stjwetla are without access to electricity, leaving residents reliant on fuels such as paraffin, wood and coal for cooking and heating purposes. Those who are residing in the backyards, where electricity has been supplied, economic constraints often lead to the use of electricity for a limited number of functions, such as lighting and entertainment, and the continued use of alternative fuels for cooking and heating. Under these conditions, residents continue to be exposed to elevated levels of indoor air pollution. Alexandra, it can be seen that electricity accounts for 43% of fuel used, whilst paraffin and Coal are used in 40% and 7% of households respectively. There have also been reports of people suffocating from insufficient ventilation particularly when paraffin and gas units are left burning at night. The Alexandra Community Clinic reports that the incidence of respiratory disorders is much higher in winter.

2.4.4   Water scarcity

According Mathee, Barnes & de Wet, (2000), the three main sources of water in Alexandra are indoor supplies (26%), on-site supplies (46%) and public taps (27%). The type of water supply option is linked to location in Alexandra. Around 90% of households in the East bank area and flats have access to water inside their dwellings. In contrast, only 5% of households in informal areas have access to an indoor water supply, which is well below the national and provincial (Gauteng) average of 64%. Sixty five percent of households in the 'S' area rely on public taps for their water (CASE 1998).

In South Africa, the access of sufficient water is a constitutional human right. Water scarcity in Alexandra Township is as a result of un-planned household settlements, the poor maintenance and un-upgraded water supply pipes, and un- availability of clean water from the polluted Jukskei River. Water contaminated by sewage and the dumping of waste expose users to wide range of diseases caused by pathogens such

as bacteria and viruses. Disease related to the unsafe and adequate water supply in Alexandra Township include typhoid fever, cholera, no-specific diarrhoea, dysentery, skin infection and helminthic conditions. The scarcity of water raises serious hygiene concerns considering that Alexandra Township is too congested and many households have backyards without no access of water to use in the toilet and for domestic purposes. Stjwetla informal settlement alongside the Jukskei River poses a serious threat of water pollution and health risk to all people. Levels of Escherichia coli (an organism which indicates faecal contamination of the water) in the Alexandra area are consistently higher than at other monitoring points along the length of the Jukskei River. During summer months, children frequently use the Jukskei River for full (swimming) or intermediate (paddling, canoeing) contact recreational purposes, (Mathee, Barnes & de Wet, 2000).

The below picture (Figure 2.3) depicts the level of contamination and the quality of water in the Jukskei River. Water from the river is used for washing clothes and bathing. The major source of bacterial pollution of the Jukskei River is inadequacy and extensive degradation of the sewer systems followed by indiscriminate dumping of waste in the river and its banks. The water quality is longer suitable for human consumption or the use of domestic purposes since it possess treats of health of all people. The existence of Stjwetla informal settlement makes it difficult even for the authorities to can able to manage or protect the river from being polluted.

Figure 2.3: An example of highly water polluted Jukskei River in Stjwetla informal Settlement in Alexandra Township. [Source: A.S. Mawela photo]

2.5   CONCLUSION

The socio-economic environmental problems that existed over decades in Alexandra Township require urgent attention to be addressed by municipality, schools and DoE district officials in conjunction with non-governmental organisations. The South African Constitution (no. 108 of 1996) includes socio-economic rights: they place an economic responsibility on the government to work towards meeting the basic needs in society and improving the quality of ordinary people's lives. They include the right to education, access to health care services, housing, water and social security and the right to an environment that is not harmful to people's health. The South African Constitution (no. 108 of 1996) enshrines the right to a healthy environment as part of the Bill of Rights. This chapter gave an overview of the background of Alexandra Township as the research site of the study. The location of Alexandra Township, the historical background and its socio-economic background were discussed.

The next chapter discusses the literature review.

CHAPTER 3
LITERATURE REVIEW

3.1   INTRODUCTION

The previous chapter gave an overview of the contextual understanding of Alexandra Township as a research site of the study. In this chapter, literature is reviewed on barriers to managing EE projects in schools globally and locally. The focus is on discussion of the following themes: Environmental Education projects implemented in Australian, American, and Canadian, Namibian, Zimbabwean and South African schools; Key role players and their competencies in managing environmental education projects in schools; Roles of key stakeholders and their competencies in managing EE projects in schools; Barriers to managing EE projects in schools and Ways of improving the management of EE projects in schools.

3.2   DEFINING THE CONCEPT LITERATURE REVIEW

A literature review is regarded as an evaluative report of information found in the literature related to a selected area of study. According to Moore and Caeli (2004:122), a literature review is "the process by which published and unpublished materials are selected to develop support for the research project". Kaniki (2006:19-22) states that a literature review assists in identifying knowledge gaps and developing a research problem, identifying a theoretical framework, identifying conceptual and operational definitions, and identifying methodologies.

In this study the literature review was used to describe, summarise, evaluate and clarify literature on barriers to managing EE projects in schools. It gave the conceptual and theoretical base for the research and helped the author to determine the nature of the research. Kaniki (2006:19) also maintains that "in order to avoid ambiguity, it must be stated that the term 'literature' is used, in this context, to refer to 'all kinds of information, including books, journals, electronic material, and oral information". In this study the purpose of literature review was to convey to the reader what knowledge and ideas were established on barriers to managing EE projects in Alexandra

Township primary and secondary schools. The literature review in this study defined a guiding concept such as the research objective and the problem of the study.

Mafora (2011:10) defines the concept literature as "a collection of published works on a specific topic, and the accumulated knowledge that resides within the collection of work on a specific topic". He further defines the concept 'review' as "systematic identification, location and analysis of documents containing information related to the research problem and a body of text that examines the critical points of current knowledge, research findings and theoretical and methodological contributions on a topic".

3.3   AIMS OF EE PROJECTS IN SCHOOLS

According to De Lange (2012:10), EE projects can be used to serve the South African nation, build social cohesion, and reduce crime in the local community. Englson and Yockers (1992:14) state that the aim of EE project is "to help students become aware, skilled, knowledgeable, dedicated citizens, who are committed to work, defend, improve, and sustain the quality of the environment on behalf of present and future generations of all living organisms".

The emphasis of integrating of environmental education in CAPS subjects is mainly to prioritize environmental issues thereby bringing awareness to both educators and learners. Awareness bring forth taking action with the aim of solving the problem. For action to be taken against any identified environmental issue, educators must possess certain skills and knowledge. It is therefore essential that educators should receive training in order to have knowledge and skills that is required to manage environmental education projects in schools. Managing environmental education projects require dedication from school principals and educators and other participants to be committed in carrying out the responsibility. Environmental education projects in schools are should mainly be established with the purpose of defending/protecting our environment, improving the environment and sustaining the quality of the environment on behalf of present and future generations of all living organisms.

In order to support schools in managing environmental education projects, Cock and Fig (2002:114) state that the South African National Parks through its directorate of social ecology should focus its EE projects on local schools and youth clubs with the aim of providing an extension from the classroom to the out-of-doors which is rich in potential and provide a multi-sensory, hands on experience; to provide a wide variety of experiences to facilitate concept development; to provide opportunities to integrate disjointed aspects of the school curriculum in meaningful activities; and to help students discover the "magic" of education in the out-of-doors", (Englson & Yockers, 1992:14).

A major outcome of Tbilisi was detailed descriptions of the objectives of environmental education. Most environmental educators (UNESCO, 1978:78) have since universally adopted these objectives. These are:

- Awareness – to help social groups and individuals acquire an awareness and sensitivity to the total environment and its allied problems;
- Knowledge – to help social groups and individuals gain a variety of experience in, and acquire a basic understanding of, the environment and its associated problems;
- Attitudes – to help social groups and individuals acquire a set of values and feelings of concern for the environment and the motivation for actively participating in environmental improvement and protection;
- Skills – to help social groups and individuals acquire the skills for identifying and solving environmental problems; and
- Participation – to provide social groups and individuals with an opportunity to be actively involved at all levels in working toward resolution of environmental problems.

EE projects established in schools should bring awareness on environmental issues and create an opportunity for educators, learners and school stakeholders to engage in a lifelong educational project, wherein knowledge to help social groups and individuals is gained and shared. EE projects should inspire a positive attitude in school principals and educators to initiate and manage further EE projects and to

motivate stakeholders to actively participate in managing such projects. EE projects should enhance the understanding of managing among school principals and educators. With reference to socio-economic related EE projects, communies acquire skills needed to overcome socio-economic challenges.

In this literature review the research seeks to find EE projects that are being implemented in schools around the African countries and other parts of the world. In addition, the researcher is interested in identifying different stakeholders, their roles and competencies in managing environmental education in schools. It is the interest of the researcher to locate the challenges faced by schools in managing environmental education projects. The researcher intended to find out if the principals and educators possess relevant skills such as planning, organising, commanding and coordinating in order to manage the EE projects as indicated by (Fayol, 2011:45).

In order to execute the idea of exploring similarities, differences and the gap in managing environmental education projects in schools from Australia, Canada, America, Namibia, Zimbabwe and South Africa holistically, the following themes were applied:

- Environmental Education projects implemented in schools
- Key role players and their competencies in managing environmental education projects in schools
- Roles of key stakeholders and their competencies in managing EE projects in schools
- Barriers to managing EE projects in schools
- Way of improving the management of EE projects in schools

The next section discusses the Environmental Education projects implemented in schools globally and locally.

3.4   ENVIRONMENTAL EDUCATION PROJECTS IMPLEMENTED IN SCHOOLS

In this literature review, the existing environmental EE projects in schools are discussed looking at countries such as Australia, America, and Canada and African countries such as Namibia, Zimbabwe and South Africa. The discussion is mainly focusing on different EE projects that are found in schools in each country.

3.4.1   School EE projects in Australia

According to Tilbury, Coleman and Garlick (2005:1), in Australia, the dominant focus of EE thought and practice is the school education sector which includes primary and secondary education, teacher education and early childhood education.

The following Australian environmental education projects were identified, namely: Environmental Waste Wise School programme, Water scarcity and Sanitation, School nutrition project, Clean-up Australia, Stephanie Alexander kitchen garden foundation EE project, and Keep Australia Beautiful EE project, (Tilbury, Coleman and Garlick (2005:1); Gough, (2004:12); (Cutter-Mackenzie, 2010); (Adams, Bartram, Chartier & Sims, 2009); (clean-up Australia, 2009); and (Stewart-Brown, 2006).

According to Cutter-Mackenzie, (2010), Waste Wise Schools was the first Australian whole school environmental education program integrating teacher professional development and learning, practical tools and resources, and a structure and process for creating a Waste Wise culture across the whole school from classroom to operations and administration. For a school to be accredited to participate, they must have a committee to plan and monitor, conduct waste assessment to determine waste generated by school, identify opportunities to reduce and recycle, draw a waste reduction action plan, create a policy, set goals, set targets, develop curriculum plan to incorporate the waste topics, implementation, and monitor and evaluate, (Eco-Recycle Victoria, 2004; cited in Kinns, 2006). This strategy supports the Total quality management theory, problems are identified, possible solutions, action plan, action implementation, and monitoring and evaluation. Australia started the Waste Wise school programme in order to deal with environmental, educational, social and

economic factors. According to Gough, (2004:12) the Waste Wise School programme was established by Eco Recycle Victoria to implement waste and litter education in Victoria schools. It was soon operating in 900 schools in Victoria and 300 schools in other parts of Australia.

Clean-up Australia encourage schools to recycle as their initiative for the Triple Bin Challenge. The 'Triple Bin' system refers to the three colours often seen for recycling (for example; Red for Rubbish, Yellow for Plastic and Aluminium Containers, Blue for Paper). Emphasising the colour system is a fun way for children to learn and adopt recycling behaviours. The following guideline are stipulated for schools to start the recycling project, namely: planning, implementation, monitoring and reporting, and identifying additional activities, (clean-up Australia, 2009).

Water scarcity and Sanitation is one of the school environmental education projects that is highly taken into consideration in Australia. According to (Adams, Bartram, Chartier & Sims, 2009) Problems faced by schoolchildren and teachers in schools often include lack of basic water supplies, sanitation and hygiene-enabling facilities. Although the supply of water and sanitation and hygiene in schools is essential and highly considered by United Nations millennium development goals on achieving universal primary education, learners in Australia are still exposed to diseases such as diarrhoea due water scarce in schools and poor sanitation.

School nutrition project is regarded as one of the crucial project since it addresses the nutritional needs of learners. School-based health promotion initiatives by (Stewart-Brown, 2006) showed that among the most effective programmes promoting health are those that focus on healthy eating, physical activity and mental health.

Stephanie Alexander kitchen garden foundation EE project, the Gould League Multicultural Gardens EE project, the Energy Smart Schools Program EE project, the Keep Australia Beautiful EE project, Carbon Kids EE project, Habitat Heroes EE project, Green Cross EE project, Reef Guardians and Jane Goodall's and Shoots, (ESCO Magazine on heading towards a sustainable future, 2010:16).

3.4.2   School EE projects in Canada

According to Rosset (2006:2), in Canada, EE is regarded as a process that provides learners with awareness and knowledge about the environment and fosters the development of the skills, attitudes and motivations to enable learners to make informed decisions and take responsible actions that incorporate environmental considerations.

The following American environmental education projects were identified, namely: School nutritional programme, Waste and recycling projects, School Gardening project, (Gate, Henning, Gates, Isogai, Metatawabin & Tsuji, 2011); www.canadaschoolrecycling.ca; and (Muehlhoff & Boutrif, 2010).

The school nutrition programme in Canada was introduced in order to address the issue of overweight and obesity in learners. The problem is especially critical in Canadian Aboriginal populations. Learners who belong to the Aboriginal population have poor intakes of vegetables and fruit, milk and alternatives, and grain products; "other" foods, those that are nutrient-poor and high in fat, sugar, and sodium, are often substituted for more healthy choices. In addressing the problem of poor intake of vegetable and fruit by Canadian Aboriginal learners, schools were considered to be place to address the nutritional challenge, since leaners generally spend six or more hours per day and they can be offered two meals per day. Effective school nutrition programs have the ability to empower students with the knowledge, attitudes, and skills required to make positive health decisions, (Gate, Henning, Gates, Isogai, Metatawabin & Tsuji, 2011)

In addition, the central disease control and prevention proposed framework to guide successful nutrition programme development in Canadian schools suggests that comprehensive school nutrition programs should integrate health education, healthy environment, and program evaluation. Besides that, it should include physical education, healthy school food service and training for teachers and staff, (Gate, Henning, Gates, Isogai, Metatawabin & Tsuji, 2011)

Canada introduced a recycling programme called Staples School Recycling Programme for different items in order to create an area of focus per school such as battery recycling programme for school. Schools are to collect batteries. Learners are bring used old batteries from home. Learners are also encouraged to collect used writing instruments for recycling purposes. School learners were also collecting electronics such as cell phones and computers parts. www.canadaschoolrecycling.ca

According to (Muehlhoff & Boutrif, 2010), School gardening as an environmental education project in Canada is regarded as something that cannot single-handedly raise the level of children's health or substitute for school meals, but it contributes towards nutrition programme. Garden activities should be supported by classroom lessons.

3.4.3   School EE projects in America

In the US, educators, school board members and developers of the curriculum were unaware of the powerful effect of the EE projects. With regard to the implementation of EE projects, most projects exist outside of the public school system, and as such, tend to be optional, limited in scope and short term, (Laina, 2004:2).

The following American environmental education projects were identified, namely: national school nutritional programme, Water scarcity and Sanitation, Waste and recycling projects, Energy efficiency projects, reducing the use of hazardous chemicals project; Ecological school yard landscaping projects; Renewal energy such as solar, Wind and geothermal projects; Green building projects; Food gardening projects, (Gelli, 2010; Adelman, Gilligan &Lehrer, 2008); (Labadarios, Mchiza, Steyn, Gericke, Maunder, Davids & Parker, 2011; Ruel & Alderman, 2013); (UNICEF, 2012); (Moczygemba, 2001); Chapman (2014:6) and (Laina, 2004:3).

In the USA, national school nutritional programme aimed at reducing obesity. Despite recommendations from leading health authorities that suggest schools should offer only healthy beverages such as water, 100% juice and lower-fat milks, sales of competitive beverages are largely unregulated in many school, which is becoming a leading factor of obesity in USA learners, (www.bridgingthegapresearch.org, 2012).

The concept of improving nutritional practices in schools is an important strategy for addressing the childhood obesity epidemic and improving children's health. www.bridgingthegapresearch.org [accessed on 2016.08.18]. According to Gorki (2016), schools have been identified as a key setting for strategies to shape healthy dietary patterns, because children often consume a significant portion of their daily calories at school, and they spend more time at school than any other environment away from home. According to (Gelli, 2010; Adelman, Gilligan &Lehrer, 2008), the importance of adequate nutrition from birth throughout childhood cannot be over emphasised. Many children will not fulfil their intellectual, physical, social, and, later, their employment potential if not well fed. (Labadarios, Mchiza, Steyn, Gericke, Maunder, Davids & Parker, 2011; Ruel & Alderman, 2013) stated that, School nutrition programmes are widely praised as an effective way to reduce short-term hunger and to invest in children's long term nutritional health.

Water scarcity in schools has negative repercussions on sanitation. In finding possible solutions to scarcity of water in schools, (UNICEF, 2012) suggested that, in USA, Parents and community members often provide unskilled labour and local construction materials to build school facilities. The process of involving parents in school planning can lead to a sense of ownership among the parents and community members. The community can make decisions and arrangements, for example, on community use of the school water tank or toilets if facilities are not available at the household level. To obtain commitment and consensus from the entire community, the local committee should report their findings and decisions to the community as a whole. In addition, in most communities, boards are responsible for the operation and management of water systems and sometimes of communal toilets. Involving them from the start can help them incorporate the school facilities into their overall work. The special staff members (general assistance) can be assigned to the cleaning of toilets.

Waste and recycling projects are common in American schools. The average American produces four pounds of trash per day. The school also contribute to huge quantity of trash produced in a day. Thirty percent of the waste disposed in the United States each year is recovered and recycled or composted, fifteen percent is burned at combustion facilities, and the remaining fifty-five percent is disposed of in landfills. It is recommended that a club or organization start the program or run it. If the school

already has an environmental club, it would be a great addition to their activities. The recycling team could consist of students, teachers, janitors, parents, and even volunteers. To ensure a successful recycling program in a school, it is recommended that teachers educate learners about the environment and the needs for recycling, (Moczygemba, 2001).

Chapman (2014:6) identified the following school EE projects in US schools, namely: waste reduction and recycling projects; energy efficiency projects; reducing the use of hazardous chemicals project; ecological school yard landscaping projects; renewal energy such as solar, wind and geothermal projects; green building projects; food gardening projects; and nutritional food projects. (Laina, 2004:3) states that the major problems like climate change, limited natural resources, habitat destruction and environmental pollution should be dealt with to educate potentially eco-literate children. Changes must be made now, which means that EE must foster intergenerational and inter-communal learning.

3.4.4   School EE projects in Namibia

According to Imene (2013:1), in terms of Namibia's draft policy for environmental education, EE is defined as the process of developing environmentally literate citizens who are aware and concerned about the total environment and are empowered through knowledge, attitudes, motivation, commitment, skills and shared decision making to individually and collectively achieve an improved quality of life through the sustainable use of and appropriate developments of Namibia's resources.

The following Namibian environmental education projects were identified, namely: Water scarcity EE project, Sanitation EE project, School nutritional programme, Water scarcity and Sanitation, (De Sousa, 2014); (Yoshikawa, 2010); (Lahnsteiner & Lempert, 2007); (Gleick, 2003); (Van der Merwe, 2000); and (Gilley, Sullivan, Tang& Tarbet, 2006).

Other environmental problems, according to the Envirotech project and EE in Namibia, 1998, includes land degradation, destruction of woodland areas, desertification,

population growth, rural land use conflicts, pollution, urban land use conflicts, lack of water and declining fish resources, wildlife extinction, overstocking and overgrazing.

Sanitation is a serious school environmental problem that Namibia is trying to address. According to (De Sousa, 2014), In Namibia, 67% or two thirds of the population lack access to improved sanitation. The situation is worse in rural areas, with 94% of people in rural Namibia not having access to improved sanitation. Levels of sanitation coverage in some regions are lower than the national average with Ohangwena at 11% and Omusati at 17%. This means that more than half of the Namibian population uses the bush or defecate in the open as an alternative to a toilet – compromising the nation's health and development. Reports indicate that 1 in 5 schools do not have access to toilets and that 298 schools do not have sanitation facilities. Reports tell us that 94% of those schools without toilets are concentrated in the 5 flood prone regions i.e. Omusati, Ohangwena, Oshana, Kavango and Zambezi

School nutrition programme is essential in all learners globally include those of Namibia. Nutrition in schools is a serious issue, a third of Namibian children are stunted about the average for much less than developed countries in Africa. This stunting affects not only the physical and intellectual development of children, but also consequently puts a brake on the future development of the whole country. There is strong evidence that links childhood under-nutrition and stunting to poor sanitation and hygiene and Open Defecation in particular. Diarrhoea and other infections like worms due to lack of safe drinking water and proper sanitation, accounts for about half of ill health and under-nutrition in children, but we have only just begun to understand why many undernourished children fail to make "catch-up" growth when their WASH and nutritional environment is improved - in other words why some children become stunted., (De Sousa, 2014).

The problem of water scarcity in Namibia is harmful to school environment and the population at large. Water scarce in Namibia resulted in finding solutions such recycling of water. Recycled water was used for toilet flushing, replenishing a ground water basin and for irrigation purposes, (Yoshikawa, 2010).
According to (Lahnsteiner & Lempert, 2007), water scarcity in Namibia schools does not come as a surprise, although it has become a serious environmental issue in the

country. Namibia is amongst the most arid countries in the world as two deserts flank it, the Namib-desert in the west and Kalahari- desert in the east. More than 80% of the country consists of desert or semi-desert. There are four main sources of water supply to the central area of Windhoek: surface water obtained from the Von Bach, Swakoppoort and Omatako dams; groundwater abstracted from 50 municipal production boreholes; reclaimed water recovered by suitable treatment from both the New Goreangab Water Reclamation Plant (NGWRP) and the Old Goreangab Water Reclamation Plant (OGWRP), (Van der Merwe, 2000). In order to increase the awareness of water scarcity and water saving, amongst other, adequate educational programmes were introduced in schools. It has been noted that in order to accomplish the programme well, water awareness programme should form part of the normal curriculum in schools. In order to minimize the outbreak of water related diseases direct potable water reuse is practised.

According to (Gleick, 2003), schools are regarded as second from office buildings type of facility that tends to be one of the largest water consumers. Irrespective of water scarce is Namibian schools, secondary schools in Windhoek had problems of maintaining suitable levels of water usage, and were unable to reduce their consumption of water even though they could not be able to pay the their water bills, and as a result the department shut off the water in an effort to encourage less use of water. The shutting of water disrupted the teaching and learning in schools. The greatest opportunity for increased water efficiency in schools is associated with the toilets. Water leakage, plumbing fixtures as well as behaviour of learners in using water are regarded as sources of inefficient water use in schools. Water saving devices such as displacement mechanisms, low-flow shower heads, self-closing taps work by slowly closing after the tap has been turned on can save up to 50% of water consumed while washing hands and faucet aerators are effective in reducing water consumption in schools, (Gilley, Sullivan, Tang& Tarbet, 2006).

3.4.5   School EE projects in Zimbabwe

In Zimbabwe the Presidential Inquiry into Education and Training in 1999 recommended the integration of EE in the school curriculum. Important milestones for EE in response to the recommendations of the commission include the development

of the Zimbabwe National Environmental policy through a multi stakeholder consultative approach which took place between 2000 and 2004 (Van Ongevalle et al., 2011). EE in action (projects) in Zimbabwe has been developed to influence policy. Policy implementation processes included integration of EE in all learning institutions at various levels. Since these recommendations in 1999, little research has been done to evaluate the implementation of EE in schools (Mukoni, 2013: 3-4).

The following Zimbabwean environmental education projects were identified, namely: School nutritional programme, Water scarcity EE project, Sanitation EE project, Water scarcity EE project, (Zimbabwe National Nutrition Strategy, 2014-2018); (Mukuhlani & Nyamupingidza, 2013); (MDG Status Report Zimbabwe, 2010)

In Zimbabwe School Nutrition programme is hindered by the economic crises that is prevailing in the country. According to (Zimbabwe National Nutrition Strategy, 2014 - 2018), Food and nutrition security exists when all people, at all times have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs for a healthy and productive life. On the other hand, food and nutrition insecurity leads to the vicious cycle of malnutrition, increased susceptibility to disease, impaired mental and physical development, reduced productivity and poverty, resulting in compromised respectability and dignity. Malnutrition is one of the most serious health problems affecting infants, children and women of reproductive age in Zimbabwe. Poor nutrition affects the performance of children in school; it affects economic productivity in adults, thereby affecting overall productivity of a nation.

In Zimbabwe, water scarcity, according to (Mukuhlani & Nyamupingidza, 2013) does not affect learners in schools only, but the entire population. Water scarcity has directly and indirectly led to the increase in water borne diseases such as diarrhoea. The rate of water borne diseases increases significantly during periods of water shortages as people fail to follow basic sanitation rules such as boiling water before using it. In school environment, Water scarcity had made basic sanitation to seem more stressful process. It had become more difficult for learners and residents to use the toilet as there would be no water to flush. The failure to have reliable water supply had forced learners and residents to find alternative place of relieving themselves, such as in the bush, of which it was unhygienic places. Places such as schools became areas where

hygiene becomes compromised. Schoolchildren were the ones who are at most risk of poor hygiene. According to the MDG Status Report Zimbabwe (2010) in addition to cholera, the recent outbreak of typhoid in Zimbabwe is also a cause for concern as it indicates the continued challenges to the provision of clean water and good sanitation, especially in high-density urban areas.

In addition, in times of the water crisis the education sector becomes so highly affected. Students often fail to attend lessons due to the non-availability of water at schools. Water shortages in schools often lead to students being forced to use the Urinary only. It has become evident that most of the learners, are compelled not to visit the toilet since they become smelly. In most schools it has been observed that there were no facilities to store water in order to maintain hygienic conditions at the schools during water shedding, (Mukuhlani & Nyamupingidza, 2013).

3.4.6   School EE projects in South Africa

The education policy in South Africa describes EE as a "vital element" for all educational levels and programmes with the purpose of creating "environmentally literate and active citizens" (DoE 1995:18). However, EE is not a stand-alone subject in South African schools and this creates a barrier to managing EE projects in schools.

The following South African environmental education projects were identified, namely: School Gardening EE project, School nutritional programme, Water scarcity EE project, Sanitation EE project; and WASH in Schools programme, (South African Social Investment Exchange, 2011); (Ndebele, 2009); (Graham, Hochfeld, Stuart & Gent: 2015); (Swartz, 2009); (Mkosi, Wenhold & Sibanda: 2014); (DWAF, 2004); (Adams, Bartram, Chartier & Sims, 2009); (Schyns, Hamaideh, Hoekstra, Mekonnen & Schys, 2015); (Lesufi, August 2013); Section 74 (2) (c) of the Municipal Systems Act, 32 of 2000); and (UNICEF, 2012).

According to the Foundation of Environmental Education (FEE) (2013:10), paper recycling, can crush, water watcher, environmental audit, pollution detectives and planting trees are some of the environmental projects that can be initiated at school

as suggested by the UNESCO-UNEP International Environmental Education Programme.

Most schools in South Africa established vegetable EE projects with the aim of helping with "food security and agriculture, small business development, vulnerable people, animal protection, education, health, and environmental conservation" (South African Social Investment Exchange, 2011). South Africa is aiming at reducing malnutrition problems. In South African, needy learners are served daily with a balanced meal which is composed of protein (soya products, dried beans and milk), starch (maize meal, samp rice and potatoes), fruits (apples, banana and oranges) and vegetables (spinach or cabbage). The school principal is regarded as an accounting officer who is responsible in overall management of the programme to ensure success of the project. The school principal identifies the educator to be NSNP school coordinator. The school establishes a Nutrition Committee comprising of the national school nutrition programme coordinator, Administrator, School Management Team (SMT), a School Governing Body (SGB) member, a Food Handler, and/or a Food gardener. The NSNP School Coordinator duty is to report all complaints/queries for assistance and support to the school principal and also by telephoning or completing a complaints form obtainable from the nearest District Office, (Ndebele, 2009)

According to (Graham, Hochfeld, Stuart & Gent: 2015), school nutrition programmes are widely regarded as excellent interventions to improve the health and well-being of children living in poor circumstances. Historically, feeding schemes were introduced as early as 1916 in South Africa. They were aimed at the 'neediest' children; however, only white children benefited (Swartz, 2009). Since the new democratic dispensation, black learners were also included in the national school nutrition programme as from 1994.They reduce short-term hunger, improve children's food security, lead to more effective short and long-term learning at school, mitigate children's vulnerability to stunting, and help manage cognitive delays associated with malnutrition. (Mkosi, Wenhold & Sibanda: 2014) stated that the objectives of the National School Nutrition Programme is to contribute towards enhancing learning capacity through school feeding, to strengthen nutrition education in schools, and to promote sustainable food production initiatives in schools. Alexandra township primary schools learners receive breakfast in class through the help of Tiger Brands Company that is working in

partnership with the department of Basic education. Besides that, learners receive lunch through NSNP on a daily basis. The secondary learners receive only lunch through the NSNP.

The seriousness of water scarcity has been recognised by DWAF (2004), who stated that, given the demographic trends, South Africa as a whole is likely to have a water deficit of approximately 1.7% by 2025. The amount of surplus water available for utilisation of any kind is therefore declining fast, implying that water is becoming a very scarce resource. Water scarce in schools impacts the sanitation management. South African schools, particularly those situated in Township are exposed to unhygienic environment due to water scarce. According to (Adams, Bartram, Chartier & Sims, 2009), Schools with poor water, sanitation and hygiene conditions, and intense levels of person-to-person contact, are high-risk environments for children and staff, and exacerbate children's particular susceptibility to environmental health hazards. Children's ability to learn may be affected by inadequate water, sanitation and hygiene conditions in several ways. These include helminth infections (which affect hundreds of millions of school-age children), diarrhoeal diseases infections, all of which force many school children to be absent from school. Uncleaned classroom environmental conditions can also make both teaching and learning very difficult. The effect of disease in teachers impairing performance and increasing absenteeism and also has a direct impact on learning, and teachers' work is made harder by the learning difficulties faced by school children. According to (Schyns, Hamaideh, Hoekstra, Mekonnen & Schys, 2015), In finding solutions to the scarcity of water, water harvesting, the re-use of waste water, rehabilitation of public water supply network, and development of water policy can be of help in managing water scarcity.

Sanitation literally means measures necessary for improving and protecting health and well -being of the people. Sanitation is any system that promotes proper disposal of human and animal wastes, proper use of toilet and avoiding open space defecation, (UNICEF (2012). It is also defined as the process of keeping places free from dirt, infection, disease, etc., by removing waste, trash and garbage, by cleaning streets, etc. (Merriam-Webster's Learner's Dictionary). In this study the concept sanitation is referred to school measures set for improving and protecting health and well-being of learners and staff. In this study the availability of water for the proper use of toilet such

as flushing and washing hands, including school cleanliness in areas such as classroom and corridors are regarded as key issues to be addressed

The MEC of education in Gauteng province initiated the project of sanitation due to unhygienic toilets in schools. The project was first launched in Tembisa, a township outside of Johannesburg about 23km away from Alexandra Township. Equal education parents' members (EEPM), churches and community organisations in over 20 townships in all regions of Gauteng Province including Ekurhuleni, Johannesburg, Tshwane, Sedibeng and West Rand vowed not to stop the campaign until all students enjoy dignified and safe sanitation in their schools. The Gauteng Department of Education (GDE) has already spent R150 million to upgrade the sanitation conditions at 578 schools serving about 500,000 students. Government contractors have fixed or replaced the toilets, taps, pipes and basins at these schools. In about 11 high schools in Tembisa, over 100 students were sharing one toilet in which some of the days there is no water to flush, wash hands or to clean, (Lesufi, August 2013).

Section 74 (2) (c) of the Municipal Systems Act, 32 of 2000, as amended, requires municipality to provide basic services through a variety of steps. The municipality seem to be contributing towards water scarce in schools. In township such as Alexandra, where there is an alarming rate of overcrowding due to increase in population and unplanned households, proper layout of water supply should be regularly upgraded. Section 4 (1) (2) of the Water Services Act 108, of 1997, provides that water services must be provided in line with terms and conditions set by the water services provider. Attention should be given into the upgrading of sizes of pipes that are supplying water to schools. Small in size pipes that are supplying water to schools and poor water pressure are some of the key factors towards water scarce and thereby contribute towards the problem of sanitation and hygiene in schools.

Learners overcrowding in schools equally demand more water more especially for sanitation and hygiene. The water services Act 108, of 1997 provides for the rights of access to basic water and sanitation. The purpose of this study was to investigate the impact of water scarce when managing 'sanitation and hygiene' as an environmental education project in Alexandra Township schools. To achieve this, an open-ended

questionnaire and participatory observation methods were used to collect data from school principals and educators.

According to (Adams, Bartram, Chartier & Sims, 2009), Schools with poor water, sanitation and hygiene conditions, and intense levels of person-to-person contact, are high-risk environments for children and staff, and exacerbate children's particular susceptibility to environmental health hazards. Children's ability to learn may be affected by inadequate water, sanitation and hygiene conditions in several ways. These include helminth infections (which affect hundreds of millions of school-age children), diarrhoeal diseases infections, all of which force many school children to be absent from school.

According to (UNICEF, 2012), an efficiently and effectively implemented WASH in Schools programme will lead to students who: Are healthier; Perform better in school; Positively influence hygiene practices in their homes, among family members and in the wider community; Learn to observe, communicate, cooperate, listen and carry out decisions about hygienic conditions and practices for themselves, their friends and younger siblings whose hygiene they may care for (skills they may apply in other aspects of life); Change their current hygiene behaviour and continue better hygiene practices in the future; Learn about menstrual hygiene and physical and emotional changes during puberty (learning to avoid menstrual odour, discomfort and urinary or vaginal infections will encourage girls to come to school during menstruation); Practice gender-neutral division of hygiene-related tasks such as cleaning toilets, fetching and boiling water and taking care of the sick.

3.5   KEY ROLE PLAYERS AND THEIR COMPETENCIES IN MANAGING ENVIRONMENTAL EDUCATION PROJECTS IN SCHOOLS.

3.5.1   Australia

In a discussion on the issue of establishing EE projects in primary schools, Gough (2004:31) indicated that several studies over a period of 25 years reported disappointingly low amounts of science and EE being taught. Primary school teachers seemed reluctant to make EE and science a priority in their teaching. Even though

primary school children are very interested in science and the environment, primary school teachers often struggle to teach science and EE because they are not confident and competent in the content, lack curriculum resources and equipment, have inadequate time to prepare, and have difficulty finding a place for science and EE in what they perceive as an already overcrowded curriculum.

Schools in Australia are regarded as key role players in managing EE projects. However, they seem to lack competency in integration of EE with subjects such as sciences. Educators at primary level are reluctant in teaching EE as a priority in their teaching since they are not confident and competent in the content. The school curriculum is regarded as already overcrowded. There is a lack of curriculum resources available to implement EE projects in schools. Educators also claim not to have adequate time to prepare for EE projects. All of the above indicate that there are several factors contributing towards incompetency of schools to manage environmental education projects in Australia.

3.5.2   Canada

Rosset (2006:5) identifies the provincial and territorial governments as the key players in overseeing EE projects in Canada. He further indicates that formal education falls within provincial and territorial jurisdiction, including the setting of the education curriculum. Curriculum policy directs what is taught in schools and affects resource allocation, teacher training and the development of textbooks and other materials. Approaches to curriculum policy and EE vary greatly across the provinces.

In Canada, almost all provinces/territories lack competency that involves approach to the development and advancement of environmental education projects. In many provinces, there is not an environmental education curriculum per se. Instead the approach to environmental education is disbursed, it appears as a topic within other subject Curricula (e.g. math, science, etc.). Manitoba DoE is only one that has taken a more active role in environmental education. For example, the Manitoba Department of Education, Citizenship and Youth has established a Sustainable Development Initiative (Unit), has developed a provincial Education for Sustainability Action Plan and has created an Education for Sustainable Development working group. Many

provincial government departments of the environment have their own environmental education programs, sometimes with both a non-formal and formal component. (Rosset, 2006:8).

3.5.3   America

According to Laina (2004:2), Most of the EE programmes in the US are run outside the public schools, and the programmes that are integrated in public schools are generally based on environmental science and are usually limited, sporadic and expensive. The programmes within the public schools are generally embedded in one subject, usually science, and this narrows their focus and provides little experience outside the classroom as part of EE project. In the world of school administrators (subject facilitators) who encourage teachers to emphasise material that will be covered by standardised tests, EE is hardly seen as a priority, and the majority of the EE projects that do exist are provided by outside experts in a hierarchical, instructor-to-student fashion.

The key role players in managing EE projects in USA are the non-governmental organisations. The environmental education related programmes are only limited and sporadic. Environmental education is hardly seen as priority by educators. The fact that EE are managed by non-governmental organisations, left school educators with limited competency in managing EE projects in schools. The danger is, the day the organisation abandon the EE project, school educators will be unable to continue managing the project since they do not have competency.

3.5.4   Namibia

According to Imene (2010:6), Envirotech is an EE project developed in 1992 by the Desert Research Foundation of Namibia (DRFN). The DRFN is an NGO funded by the Swedish International Development and Co-operation Agency (SIDA) which was tasked by the Ministry of Basic Education and Culture (MBEC) to investigate the curricula of EE in formal education. Educators had to introduce the Envirotech project plan across the curriculum.

Similarly to America, Namibian EE projects are piloted by non-governmental organisations with expertise and competency in managing them. Schools are tasked to integrate the EE projects within their curriculum, and that happens before training on how to manage EE projects.

3.5.5   Zimbabwe

According to Mapira (2013:1) Zimbabwe's media plays a key role in the dissemination of environmental education (EE) information. One of its goals is to inculcate positive values, attitudes, and behaviour change of the public towards the biophysical and cultural environments with a view to promoting sustainable development (SD) at local and national levels. The country's media seeks to 'promote environmentally friendly habits through the production of well researched, balanced and probing environmental stories in indigenous languages as well as English' (Zimbabwe National Environmental Education Policy and Strategies, 2003:31).

The difference between Zimbabwe and USA and Namibia is, Zimbabwe, the media is focusing on bringing awareness to the public about environmental problems. There are no experts deployed to schools to manage EE projects, who will work with schools and impart knowledge and skills with educators. Schools will then lack competence and expertise in managing EE projects.

3.5.6   South Africa

In South Africa, most EE projects are the initiatives of non-governmental organisations. The Eco-Schools programme is an international programme of the Foundation for Environmental Education that was developed to support environmental learning in the classroom. The programme is active in 58 countries around the world and has been implemented in South Africa since 2003 by Wildlife and Environment Society of South Africa (WESSA). The programme is aimed at creating awareness and action around environmental sustainability in schools and their surrounding communities as well as supporting Education for Sustainable Development (ESD) in the national curriculum. With over 50% of the content in some CAPS subjects being

environmental in nature, Eco-Schools make a positive contribution towards improving education in South Africa, Eco-Schools Handbook. (2015:11).

Matthews (2015:1) indicated that, WESA requires schools to register their own EE projects. Schools should stay registered for at least a period of three years. Schools are allowed to request assistance in managing the projects. Assistance is not limited only to skills, knowledge and equipment, but also funding from sponsors of WESA. The educators attend workshops which build their capacity to manage their EE projects such water-wise, greening the school, recycling and vegetable gardening. They are then required to develop curriculum-linked lessons that can be facilitated in their school EE projects.

In 1982, the Environmental Education Association of Southern Africa (EEASA) was established among a group of environmentalists and environmental educators, many of whom were from South Africa, department of environmental affairs and tourism (DEA & T 2001:15) with the aim of establishing EE projects in response to schools and community needs to help the next generation build academic and life skills, prepare for and succeed in higher education and employment and contribute as leaders to South Africa's economic and social development.

Many school projects, among others, the Nutrition school project, help learners who go to school hungry. The Daily Sun (21 May 2013) states that pupils in primary schools are fed by non-governmental projects, such as the African Children's Feeding Scheme. In addition, the importance of recycling in schools is also in the hands of non-governmental organisations. Non-governmental organisations are responsible in feeding learners and recycling at school, but not the school itself.

Francina Rammabi, director of Shomang Sebenzani Development Initiative which is a non-governmental organisation in Alexandra Township, (Daily Sun of 4 October 2013) stated that the organisation is involved in teaching learners how to plant trees along the Jukskei River.

South Africa shares similarities with other countries indicated above. Most of the EE projects are the initiatives of the non-governmental organisations with expertise and

competency in managing EE projects. Although EE is integrated in curriculum subjects there is a need for competency in managing EE projects by educators in order to promote sustainability of the projects.

3.6 BARRIERS TO MANAGING EE PROJECTS IN SCHOOLS

3.6.1 Australia

Tilbury et al. (2005:3) state the following as barriers to managing EE projects in Australian schools: EE is simply seen as an add-on or a cross-curricula theme, teaching and learning approaches do not cater for EE projects and EE remains a non-mandatory component of schools and still struggles for acceptance in mainstream curriculum in Australia. Furthermore, while some teacher education and professional development courses may include EE concerns, these programs generally do not adequately prepare teachers to effectively use learning for EE approaches to EE projects/ education in the classroom, and lastly, to most teachers and school managers, EE remains a of low priority.

3.6.2 Canada

According to Lange (2010: 12) in Canada, EE projects are rarely integrated with the mainstream curriculum subjects, are typically of short duration, often lack theoretical or methodological sophistication, and show little compelling evidence of having long-term effects on most students. Poor nutritional diet in Canada which results in overweight, more especially to the Aboriginal population is associated drastic cultural and lifestyle changes that has led to an epidemic of obesity more severe than in the general population.

In Canada, in some provinces of schools do not have EE as part of curriculum. In other provinces, EE is dispersed; it appears as a topic within other curriculum subjects such as mathematics and science subjects. Depending on a particular province, the department of environment initiated their own EE projects in partnership with non–governmental organisations, instead of partnering with schools. Issues such as

provincial budget cuts resulted in lack of money to fund the EE projects in schools (Rosset, 2006:8).

3.6.3   America

There are two identified barriers in incorporating nutrition education into the classroom curriculum in USA, namely: competing academic expectations and lack of classroom time. Educators in elementary schools indicated that, they tried to include nutrition education into their curriculum but lack time, in another instances, educators view lack of a suitable curriculum that is combined with nutrition education as a barrier. Educators find it difficult to find nutrition curricula that is easy/short lessons/ readily available and embedded across curriculum. Educators are also not trained to teach such content. Teaching learners about nutrition assist them in having relevant knowledge on what they should eat. Food handlers who are preparing food for learners can easily be informed on what to prepare for learners depending on their nutritional diet. Most classroom teachers preferred a nutrition curriculum which can be integrated into other state-tested subject Matters and includes a school cafeteria component and parent participation, (Perera, 2015)

According to Bartosh (2003:113-114), educators indicated that lack of funding and resource materials are barriers to managing environmental projects in schools. In addition, educators also highlighted that, they need more time for planning EE projects. Lack of support from administration and district to develop and maintain EE projects were also identified as barriers to managing EE projects in schools. Furthermore, lack of time to engage in EE projects and lack of support from school leadership and administrators (district officials) were identified as barriers to manage EE projects in schools. It was further eluded that lack of training on how to manage EE projects and the expectations of curriculum coverage contribute to poor management EE projects. Educators were found to be lacking commitment and knowledge and skills on how to manage EE projects.

In a survey conducted by Chapman (2014:4) on EE projects in schools in twelve states of the US, his findings indicate that teachers feel overwhelmed to take care of reading, writing, math. EE often feels like a separate topic and therefore there is not the same

enthusiasm to participate outside the classroom as part of EE projects; school principals indicated not having budget and personnel to organize/fund/lead the EE projects proposals; schools lack a plan on how to manage EE projects; projects are haphazard; school principal and educators indicate that they need time for the competing initiatives for which they are accountable; All of the organizational efforts are on a voluntary basis for staff; there is no compensated time; and this results in no real buy-in from staff and students. EE projects within public schools, are generally embedded in one subject, usually science, making their focus unnecessarily narrow, and provide little, if any, out of classroom experiences. Primary and secondary schools are lacking classroom experience and experimentation based on EE projects. There is also a serious lack of funds to fund EE projects in schools (Laina, 2004:4).

3.6.4   Namibia

The barriers in introducing Envirotech in Namibia includes the following: the resistance to change on the part of the teachers, school management, learners and parents; lack of confidence and experience on the part of the teacher; lack of support from school management who in many instances do not understand new methodology being promulgated through educational reform; and lack of relevant, appropriate and user-friendly resources (Envirotech: Pilot Phase, 1998: 16).

Finding by Haindongo (2013:192) on the lack of collegiality among teachers and principals in Namibia indicated that the school academic staff does not work together to make EE teaching possible. Teachers also seem not to care about nature. Principals also do not support teachers in EE and do not allocate funds for it. This is blamed on lack of understanding of EE and its importance by principals and teachers of departments other than science.

3.6.5   Zimbabwe

Mukoni (2013:12) states that there is a limited commitment from educators to the principles and practices of EE, which is likely to impede the social transformative potential of other members of the school community such as the students and ancillary staff. EE values have not permeated the teachers in particular as they are not taking

steps to manage and engage other school stakeholders into an environmental ethic deemed necessary to transform individuals and communities. Environmental issues and values are not at centre stage in the life of the schools. In addition, although the schools have established centres for recycling projects, water wise projects and vegetable garden projects on school premises, teachers were not able to fully recognize their pedagogical value. This indicates that teachers are not making effort to use the sites in the communities or solve environmental problems of the community.

3.6.6   South Africa

According to King (2015:57), some of the challenges concerning management of school EE projects include lack of community involvement; poor assistance from school management and the school governing body; lack of funds to fund the project; lack of cooperation among educators; lack of material and resources; and workload of educators. Bhana, Morrell, Epstein and Moletsane (2006:13) similarly argued that an overloaded curriculum and multiple complex demands on teachers mean that such responsibilities are very difficult and may go unperformed.

Managing environmental education projects in schools is the responsibility of everyone in the school, namely, teachers, learners, school management team members, School Governing Body members and the parent component. They collectively need to discuss and clarify how best to profile school activities and support the development of environmental education projects. These are better if they are in line with the school curricula. Teachers, as the representatives of parents in schools, need to lead the process. It is important for school managers to create an atmosphere in which every individual feels free to contribute towards EE projects in schools.

3.7   WAYS OF IMPROVING THE MANAGEMENT OF EE PROJECTS IN SCHOOLS

3.7.1   Australia

Herein are some of the suggestions in Australia to improve the management of EE projects in schools. For schools to improve in the management of EE projects, schools should be provided with incentives to develop their own school policy and action plan for EE projects. The whole-school approaches, which involve staff, students and community in learning for change towards EE project management, is seen as crucial since it engages every person at school. This idea is upheld in schools in order to make everyone take ownership of EE projects initiated in schools. Furthermore, it has been suggested that schools should develop strategic networks among school principals, educators and the schools communities to promote working together towards change of the management of EE projects. The process of networking will eventually work towards the development of a mentoring program for educators and managers' working in EE centres and help schools explore and learn different approaches to managing EE projects and determine how it influences their work. A national network that links those working on the EE projects together could support the mentoring and develop a set of criteria/systems for the evaluation of effective EE projects (Tilbury et al., 2005:3-5; Gough (2011: 12).

In addition, the national action plan in Australia outlines the fundamental strategies on how to manage EE projects. These include the emphasis on providing people with knowledge, values and skills to make a difference to the protection and conservation of Australian's environment, to raise a profile of EE and provide expert advice to Australia on EE issues, while promoting and sharing successful Australian initiatives and expertise in EE projects. Lastly, national and international partnerships are invited to strengthen and re-orientate policies and programs on EE in schools (Environment Australia, 2000: 5).

Other strategies to improve the management of EE projects in schools include professional development for educators. Educators who did not receive training on EE can attend short courses to enhance their knowledge on how to teach, initiate and to

manage EE projects. Educators teaching different subjects should plan together and coordinate similar activities to initiate one EE project that will involve the whole school. Lastly, school principals should improve systems to support the management EE projects in schools (Gough, 2011: 14)

Furthermore, in 2001 Australia, as a way of making progress with regard to means of improving the management of EE in schools, established two EE subjects at the senior secondary level: Environmental Science (a science subject) (Board of Studies, 2000a; VCAA, 2004) and Outdoor and Environmental Studies (a health and physical education subject (Board of Studies, 2000b; VCAA, 2005a; Gough, 2011: 17). The stand-alone EE as a subject gives value to EE projects, unlike when it is integrated to other curriculum subjects.

3.7.2   Canada

Developing school policy that will uphold the importance of Environmental Education in school is of outmost important. Environmental education should be regarded as the responsibility of the whole school community. It is more than a curriculum issue and involves schools in managing resources and grounds in a way that causes no significant damage to the environment and considers the needs of future generations. It should be considered as a lifelong multi-disciplinary approach to learning that helps people to understand and appreciate the environment and their connection to and impact on it. In addition, it should be considered as process which develops awareness, knowledge and understanding of the environment, positive and balanced attitudes towards it and skills which will enable students to participate in assessing the state of the environment.

3.7.3   America

Laina (2004:17) suggests that students should be directly involved in identifying environmental problems and solutions, not just absorbing and memorising facts. Parents and community members need to be brought into the learning process, particularly considering that environmental literacy is something that all citizens should be striving for, not just children.

In the US, the list of published EE curriculum guides that can be used in classrooms is extensive. Projects WET (Water Education for Teachers), project WILD and project Learning Tree are three nationally produced curricula that are very popular among educators. The popular topics covered in science and social sciences subjects are resource conservation and recycling, (Bartosh, 2003:26).

As part of the recommendations to ease the barriers to managing EE projects in schools, Chapman (2014:5) suggests that school principals as leaders should have a clearly articulated strategic vision on how to manage EE projects. At district level, subject facilitators and IDSOs should have a wide coordinated plan of EE projects. There should be a plan to locate place for school gardening projects and playgrounds; additional funding is required to support EE projects; more commitment is required from top-level officials from departments of education in managing EE projects in schools; there is a need of district policy regarding EE projects in schools; resources and time should be dedicated to EE projects in schools; and lastly, more funding for school level staff who focus on EE is needed.

3.7.4   Namibia

Educators in Namibia expressed the need to be involved in curriculum development because they find it advantageous to their work. Teachers explained that the process would enable them to understand their task better, air their grievances, and contribute to the discussion based on the reality in their classrooms. However, the development of curriculums in Namibia has followed a positivist approach which excludes the input of teachers. Advisory teachers (Subject facilitators) think that teachers experience no problems in teaching EE because they do not voice their concerns (Haindongo, 2013:189).

As a way of finding solutions to EE projects in Namibian schools, educators would like to have co-ordinators for EE in schools. Such a coordinator should be someone who organizes the EE projects in the school. The absence of a coordinator affects the implementation of EE because there is no one to monitor EE projects and to ensure that teachers' needs are addressed. The coordinator should be someone trained and

knowledgeable in EE approaches who can assist teachers in the management and implementation of EE (Kanyimba, 2002:75-76).

3.7.5   Zimbabwe

Herein are some of Mukoni's recommendations for the schools in Zimbabwe to manage EE projects effectively and efficiently. It is suggested that educators should take EE projects much more seriously in order to attract learners and community members. Community involvement in EE projects should aim at raising awareness that promotes finding solutions to environmental problems thereby creating alternatives to environmental unfriendly behaviour.

In addition, it also suggested that EE in the curriculum must stimulate social, political, economic and environmental change in nearby communities by shifting the community's consciousness to improve environmental quality. Furthermore, all staff members should participate in a school EE project as a way of promoting ownership of the project. Lastly, EE in the schools must not aim to prepare students for participation in the community as it exists, but must take initiatives in the community to bring about transformative change by engaging learners and teachers in a process of self-reflective transformation through action competence.

3.7.6   South Africa

In South Africa national government, provincial government, para-statal organisations and many non-governmental organisations support school-based EE projects. Educators and learners receive developmental programmes and support materials (such as the Share-Net resource network) and school group visits to provincial EE centres (DEA & T 2001:15). While these various agencies were often the only EE support teachers could call on, their activities were also often not co-ordinated and at times poorly integrated with school programmes and curricula (DEA & T, 2001:15).

In most schools in South Africa, non-governmental organisations are the key establisher of the EE projects and they do not release the total control of the management of the EE project; thus, the school/educators do not feel like the owners

of the projects. Negligence, lack of dedication and understanding of the importance, aims and objectives of the EE projects are then the result.

3.8   THE SUCCESSES EXPERIENCED IN MANAGING EE PROJECTS IN SCHOOLS

The progress in EE in Australia has been made through curriculum development, sustainability projects, and the enthusiasm of teachers, parents and the community. The community and corporate EE programmes in Australia contribute to good management of EE projects in schools such as the land-care EE project.

According to Thomson (2006: 11) excellent environmental education project should be credible, reputable, and based on solid facts, traditional knowledge, or on science. Values, biases, and assumptions are made explicit. Should, Create knowledge and understanding about ecological, social, economic, and political concepts, and demonstrate the interdependence between a healthy environment, human well-being, and a sound economy.

In Canada, It is generally agreed that environmental education is a process that creates awareness and understanding of the relationship between humans and their many Environments natural, man-made, cultural, and technological.

Environmental education is concerned with knowledge, values, and attitudes, and has as its aim responsible environmental behaviour as stipulated in

According to Lieberman and Hoody (1998:4), schools with EE projects do better academically, according to a standardised yardstick of achievement in reading, writing, mathematics, science and social studies. Furthermore, discipline and classroom management problems become less, and the learners make connections across disciplines. As EE projects are about real life, learners are able to think along the lines necessary for solving problems in their everyday lives. They learn more enthusiastically and take greater pride in what they achieve, in so doing take ownership of their achievements.

Furthermore, social EE projects, such as HIV/AIDS awareness and health promotion project, aim at bringing awareness and equipping educators, learners and parents with knowledge on how safeguard themselves against disease. Moreover, identifying sources of water pollution in a stream project focuses on identifying sources of water pollution in rivers/streams that are near the school. Such projects are carried out with the aim of bringing awareness to both learners and community on waterborne diseases. Lastly, overharvesting of medicinal plants project aims at protecting rare plants that are important in the medical field. This is part of conserving indigenous plant species within and surrounding schools (King, 2015:84).

3.9   SYNTHESIZING

It is evident from the literature review that in Australia, Canada, America, Namibia, Zimbabwe and South Africa environmental education is taken seriously, hence the existence of various EE projects. The establishment of each EE project serves a certain purpose depending on the environmental problem that needs to be addressed. Some of the common environmental education projects include, School Nutrition Projects, Gardening project, Sanitation project and water scarcity project.

In most instances, schools seem to be battling with the issue of managing environmental education projects due to certain barriers or challenges such as, the reluctance of educators in participating in EE projects, Lack of funds and other related resources are also mentioned to justify reasons why EE projects are not a success in many schools, the overcrowded curriculum that does not allow educators to have time for EE projects and lack of support from the general staff in schools. It is expected that, the head teachers (principals) and school boards play an important role in managing EE projects in schools. Therefore, School managers have the particularly important task of creating an atmosphere in which every individual feels free to contribute good ideas and suggestions towards the management of EE projects.

Non-governmental organisations depending on the type of EE projects seem to the ones that are having more influence in managing EE projects in schools, although in certain instances are blamed of taking over all the responsibilities and not letting the schools to take over certain tasks. Environmental organisation such as Envirotech,

WESA and UNICEF are much more involved in bringing awareness on environmental issues in schools. It can be concluded in this study of literature that, the success of EE projects in schools is often through the involvement of the Non-Governmental organisations.

Next, is the table that summarises EE projects in schools globally and locally

TABLE 3.1: SUMMARY OF CONTENT ON EE PROJECTS IN SCHOOLS GLOBALLY AND LOCALLY

Countries	EE projects in schools	Role players in managing EE projects	Barriers to managing EE projects	Involved stakeholders	Way of improving EE management
Australia	- kitchen garden foundation EE project, - Gould League Multicultural Gardens EE project, - Energy Smart Schools Program EE project - Keep Australia beautiful EE project - Habitat Heroes EE Project	- Educators	- Lack curriculum Resources and equipment - Teaching and learning approaches do not cater for EE projects - Reluctance from Educator to teach EE projects - Overcrowded curriculum - Current programmes do not prepare educators to effective use EE projects	- Community & Corporate Resources programme - Waste Management project - Water-wise School programme	- Provided employees with incentives to develop their own school projects - The whole-school approaches, which involve staff, students and community

America	- Projects WET (water Education for Teachers), - Project WILD, - Project planting Trees	-Educators	- Lack of funding - Principals lack EE planning - Lack of support from district officials - In assessing EE is not a Priority - EE projects are expensive to manage	- Non-governmental organisations	- In-service training for principals & educators - Assessment should include EE themes
Canada	- Water-wise EE project - Greening EE project - Vegetable Garden EE Project	- The provincial and territorial governments - Educators	- Lack of a coordinated approach to EE projects - Provincial budget cuts towards EE projects	- Non-governmental organisations	- Provisioning of funds for EE projects - In-service training of principals & educators

Namibia	- Land degradation EE Project - Preserving the destruction of woodland areas, desertification, & population growth awareness project	- Educators - School management	- Educators lack of confidence and experience; - Lack of support from school management	- Non-governmental organisations	- Educator involvement in curriculum development - Introducing EE as a subject
Zimbabwe	- Recycling EE project - Water-wise EE project - Vegetable garden project	- Educators	- Limited commitment to The principles and practices of EE project - Lack of resources (money & people)	- Non-governmental organisations	- EE in the curriculum must stimulate social, political, economic and environmental change
South Africa	- School greening projects - Overharvesting of medical plants project - Waste collect project - Clean-up/Sanitation EE Project	- School principals - Educators,	- Lack of assistance from school management; - Lack of funds to fund; - Educators workload - Reluctance from Educators and staff	- Subject Facilitators - IDSO's - Non-governmental organisation	- Introduction of Environmental Education as a stand-alone subject - In-service training/workshop - Involvement of NGO's

3.10 DISCUSSION ON BARRIERS TO MANAGING EE PROJECTS IN SCHOOLS

Rickinson (2004:14) states that the confidence and level of expertise of educators, impacts not only on teacher choices as to what to teach, but also how to teach the content and how well they can teach the content. Moreover, physical barriers such as time, resources, and support and students to staff ratio, course structure, school day schedules and school budgets restrict the teaching of action-based (projects) environmental education.

In South Africa, EE is integrated in other Curriculum Assessment Policy Statement (CAPS) subjects. As indicated by Rickinson above, the confidence and the level of expertise of educators to integrate and to manage EE projects in this case is doubtful, since educators did not undergo training. Educators make choices as to what to teach in the subject that they are trained to teach and thereby avoid subject content integrated into their subject since they lack knowledge about them. The work coverage versus the time allocated for the subject is a barrier for educators to engage in EE projects.

In addition, much indecision prevails about the status of EE within the school curriculum in South Africa (Maila, 2003:39). As policy analysts have long noted top-down policy-making underestimates local barriers and constraints at the local -level. Consequently, schools are being forced to comply with the top-down approach without their voice being heard as the implementers of the policy.

E-Study Guides for effective project management by Robert (2014:1) state that project management is the discipline of planning, organising, motivating, and controlling resources to achieve specific goals. A project is a temporary endeavour with a defined beginning, usually time constrained and often constrained by funding or deliverables, which is undertaken to meet unique goals and objectives, typically to bring about beneficial change or added value.

According to Shead (2001:27), managing is the art of conducting, directing and leading by example. Managing characterises the process of leading and directing the

organisation through using techniques of deployment and managing resources, such as human, financial, material and intellectual resources.

Le Roux and Maila (2004:240) state that the inability to generate a whole school approach, the lack of support from school management, the lack of educator self-confidence to manage EE projects, lack of human resources and the inability to identify human resources and knowledge required in managing the EE projects are barriers to EE project management in schools. EE projects that are not well planned, and not well communicated to other stakeholders will obviously not have good results. Moreover, the lack of confidence on the part of educators is often due to a lack of knowledge on how to manage the EE project.

According to Krishnan (2008:18), the word accountability is the synonym of responsibility, liability, culpability and answerability. School principals are accountable managers in all projects that take place within and outside the school as long as the name of the school is involved. In cases where the school has partnered with a non-governmental organisation, both the school and the organisation should equally be held accountable for proper project management. In a situation where one organisation lacks responsibility, accountability or cannot be answerable, it creates a barrier in managing EE projects. Bisschoff (2005:7) indicates that, it is important for school principals and educators in schools to apply their knowledge, skills, tools and techniques when managing EE projects in order to meet or exceed stakeholder needs and expectations from a project.

Martins and Martins (2008:380) state that the school managers should create a culture that sets high levels of commitment and performance, creating the necessary knowledge to manage EE projects and commitment to the school. This can easily be achieved by sharing knowledge and understanding of how to manage projects as stipulated by Bisschoff (2005:28-29). In each EE project, school principals should ensure that the scope of the project has been laid down properly, followed by the time frame of the project, the planning and the control, the available human resources to carry out the tasks, the means of communication to be used, the risks in under taking such a project and lastly the way in which the necessary resources will be procured.

If all these can be adhered to, EE projects can successfully be managed; if not barriers to manage EE projects will be experienced.

Gebreab and Bak (2000:10) indicate that there is a severe shortage of skilled teachers able to integrate EE effectively into the educational programme. Lack of skilled teachers is a barrier in managing EE projects in schools. The lack of community involvement is a result of lack of clarity regarding the EE projects in schools. Schools do not have people with sufficient leadership ability; they lack the ability to take responsibility; they are not sufficiently expert, lack resources and funding from various non-governmental organisations that will possibly bring forth different expertise, roles, leadership and responsibility in managing EE projects in schools.

Rickinson (2004:34) lists the following as barriers to EE outdoor learning activities in schools, namely: the concern for children's safety and the legal liability associated with potential risks; confidence and level of expertise, which impacts not only teacher choices as to what to teach, but also how to teach the content and how well they can teach the content; physical barriers such as time, resources, and support are; students to staff ratio, course structure, school day schedules, and school budgets. These all restrict the teaching of action-based (projects) environmental education.

According to Symons (2008: 5), time and money, lack of priority given to the project, a knowledge gap, and lack of training for principals and educators are barriers in managing EE projects in schools. There is a lack of in-service training from professionals to equip principals and EE project coordinators in schools. Schools do not have EE project policies that guide them on how to run the EE projects. The DoE must have a standardised EE project management policy for schools.

3.11   DISCUSSION ON MEASURES USED TO ADDRESS BARRIERS TO MANAGING EE PROJECTS IN SCHOOLS

In order to improve schools, it is essential that schools should have time to create and share a vision as a whole school community. This will create the atmosphere wherein all staff members will own the EE projects and feel responsible and accountable. In addition, schools should have a joined-up approach with clear linking initiatives,

supported by senior management of the school, subject facilitators, IDSOs, and non-governmental organisations. Furthermore, the distribution of leadership in a project for the sake of sharing the responsibilities and to increase participation can enhance the management of EE projects in schools. School EE projects should be formalised to an extent that policies are embedded in curriculum subjects and are supported by adequate budget and staff. The role of the DoE cannot be overlooked with regard to the provisioning of training and supply of necessary resources for the success of EE project management in schools. Educators and school principals' training on addressing the pedagogical principles relevant to EE projects is essential (Symons, 2008:7).

Tilbury et al. (2005:3-5) suggest that a national network that links those working on the EE projects together could support mentoring and develop a set of criteria/systems for the evaluation of effective EE programs. School principals and educators must make use of the available non-governmental organisations managing environmental programmes in order to gain insight on how to manage school EE projects.

Chapman (2014:5) suggests that, school principals as leaders should have a clearly articulated strategic vision on how to manage EE projects; and at district level, subject facilitators and IDSO's should have wide, coordinated plan for EE projects.

For schools to manage EE projects it is important that the projects are integrated with other subjects, with the aim of increasing educators' total engagement, collaborative planning in managing EE projects and curriculum themes around the EE projects.

In this regard, Haindongo (2013:189) states that teachers in Namibia expressed the need to be involved in curriculum development because they find it advantageous to their work.

3.12   CONCLUSION

This chapter reviewed the literature on barriers to managing EE projects in Australia, Canada, America, Namibia, Zimbabwe and South Africa with emphasis on existing school EE projects, key role players and their competencies in managing EE projects, barriers to managing the projects, ways of improving the management of EE projects in schools and success in managing EE projects in schools.

The next chapter will focus on the theoretical framework which the researcher has used in exploring barriers to managing EE projects in schools.

CHAPTER 4

THEORETICAL FRAMEWORK

4.1   INTRODUCTION

Chapter 3 of this study reviewed literature which focused on exploring barriers to managing EE projects globally and locally. This chapter examines the phenomena of managing EE projects in schools, followed by the discussion on various management theories in relation to managing EE projects in schools. The total quality management theory, the theory that calls for the use of systematically collected data at every point in problem-solving, and systemic management theory, which calls for a specialized process of pattern-based decision-making that avoids inconsistency, subjectivity and error were discussed as framework of the study. The chapter concludes with indications of how various management theories can be used to facilitate the process of managing EE projects in schools.

4.2   DEFINING THEORETICAL FRAMEWORK

Trochim (2006:15) states that there are two domains in research theory and observation. Theory is what is going on inside the head of the researcher, while observation is what goes on in the real world where data are collected. A theoretical framework provides a well-supported rationale to conduct the study and helps the reader to understand the perspective of the study. It assures a reader that the type of investigation proposed is not based solely on personal instincts or guesses, but is rather informed by established theory and empirical facts obtained from credible studies (Simon, 2011:1).

In this study the conceptual framework was based on barriers to managing EE projects in Alexandra Township primary and secondary schools. Literature was reviewed in order to establish connections between the focus area of research site and global experiences with regard to EE projects in schools, barriers to managing EE projects, causes and possible solutions to them. A literature review dealt with the US, Canada, Australia and parts of Africa such as Namibia, Zimbabwe and South Africa. The review

gave direction when formulating the research questionnaire to collect data and also helped the researcher to focus on total quality management and systemic management theories.

In this empirical study, the systemic management and total quality management theories were used with the aim of exploring systems and quality of EE project management in schools both globally and locally.

4.3   TOTAL QUALITY MANAGEMENT THEORY

Total quality management theory calls for the use of systematically collected data at every point in a problem-solving cycle - from determining high-priority problems, through analysing their causes, to selecting and testing solutions (Juran, 1974: 22.1-28.1; Ishikawa, 1985: 104-105; Deming, 1986: chap. 8). TQM provides a historically unique approach to improving organizational effectiveness, one that has a solid conceptual foundation and, at the same time, offers a strategy for improving performance that takes account of how people and organizations actually operate (Wruck & Jensen, 1994).

EE projects aim at problem solving of environmental issues through analysing their barriers, causes and possible solutions. Total quality management, is required to provide necessary strategies of managing EE projects in schools. Brennan and Shah (2000:12) indicate that total quality management refers to the systems which are developed to monitor all processes that are part of the work of an organisation. There are quality assurance models available from different parts of the world, namely, the South African Bureau of Standards (SABS ISO 9004-2), international standards organisation (ISO) 9000 system, European Foundation for Quality Management 1992 (EFQM), the US systems of accreditation and total quality management systems.

In this study, schools are seen as institutions of teaching and learning where the manager (principal) is expected to meet certain standards in managing the school, with reference to the international standards organisation (ISO) 900 series which focuses on stimulating trade by providing assurance of an organisation or an institution' s ability to meet speciation and perform the negotiated standards. Schools

are expected to manage EE projects displaying organisational quality systems of planning, organising, coordinating and monitoring (Lampercht, 1992:17).

Moreover, according to the total quality managing system, quality assurance and quality improvement tend to go beyond traditional customer satisfaction by addressing the needs of internal customers such as, in this case the DoE subject facilitators and IDSOs and non-governmental organisations partnering with schools to manage EE projects. It is the aim of total quality managing systems to provide tools for improving the quality of the management of EE projects in schools. The assumption is that true knowledge of managing EE projects in schools by school principals provides confidence in educators to integrate EE in CAPS subjects.

Furthermore, the SABS ISO 9004-2 acts as guideline (1991) to ensure that all services, requirements and provisions incorporated in the quality system should be defined and documented as part of the service organisation's overall agents. In this study, the services required will include human resources, equipment and funds to ensure the smooth management of EE projects in schools.

According to Deming, (1993: 58-61) the total quality management authorities suggest several techniques to help quality teams use their collective knowledge effectively in identifying and analysing opportunities to improve quality. Three of the most commonly used devices are flowcharts, brainstorming, and cause-and-effect diagrams.

A flowchart is a pictorial representation of the steps in a work process. Flowcharts, which use standardized symbols to represent types of activities in a process, help members identify activities that are repetitive, that add no value, or that excessively delay completion of the work (Deming, 1993: 58-61). School principals, educators, subject facilitators and IDSOs should holistically start the EE project collectively as a strategy to share knowledge, skills and resources required to manage the project and bring forth the opportunity to analyse means of improving the quality of managing it.

The involvement of all stakeholders in managing EE projects in schools also require brainstorming: school principals, educators, subject facilitators and IDSOs as groups should generate lists of ideas about the management of EE project such as the

potential barriers, causes of barriers, possible solutions, and issues likely to be encountered in implementing those solutions. Its purpose is to tap the creativity of EE group members by explicitly ruling out the evaluation of member contributions to the list and actively encouraging building on others' ideas.

A cause-and-effect diagram or "fishbone" was developed by Ishikawa to graphically represent the relationship between a problem and its potential causes. Fishbone diagrams can help EE group members to examine thoroughly all possible barriers, causes of a quality problem and discern the relationships among them. In applying this approach, EE project group members should place the problems of managing EE projects at the right-hand side of the page (the head of the fish). The "bones" of the fish are lines on which members list the potential causes by category; the generic categories are causes related to people, tools, materials, and methods. Members then collect data to assess the potency of each of these potential causes (Ishikawa, 1985: 63-65).

In this study the 'head of the fish' is 'management of EE project' and 'the bones' are barriers to managing EE projects. A structured questionnaire was used to diagnose the barriers to managing EE projects in primary and secondary schools. School principals, educators and subject facilitators listed potential causes and possible solutions related to barriers to managing EE projects in schools.

Total quality management philosophy is evident in various quality management systems and is instrumental in setting standards and can even be regarded as a vehicle for achieving them. The following process forms an important basis for understanding quality management systems. Doherty (1994:11) indicates them as follows: quality assurance is a prevention-based approach and is about products working reliably in future and about services activities being dependable and consistent. Quality assurance has to give confidence that future activities will produce the desired end result. It is a means of ensuring that errors are, as far as possible, designed out. In relation to school EE projects proper planning, organisation and monitoring of EE projects by school principals gives confidence to EE educators in planning future EE projects. Monitoring eliminates possible errors/ barriers to managing EE projects.

Total quality management in school EE projects examines the aims, content, resourcing, levels and projected outcomes of the project. Quality control involves operational techniques and activities such as measuring, examining, testing and gauging one or more characteristics of an entity and comparing these with specified requirements in order to determine whether each characteristic conforms to the requirements of managing EE project. It can also be regarded as means of gaining information so that barriers in managing EE projects can be corrected.

In addition, total quality management in school EE projects require quality control and feedback from educators, staff, students and even external customers involved in managing the project. It also requires monitoring and review of EE projects, Moreover, EE projects require quality audits as means of organisation checks that the procedures are really being implemented. An audit checks that systems do what it says it is going to do and there is written, documented evidence to prove it. In EE projects the quality management system may be audited internally (by the school principal) or externally (by district officials). Lastly, there is a need in school EE projects that quality assessment is conducted, since it is the judgement of the performance against either internal or external criteria.

The next section will describe systemic management theory and also discusses how the theory facilitates the management of EE projects in schools.

4.4   SYSTEMIC MANAGEMENT THEORY

Systemic management is presented as a specialized process of pattern-based decision-making that avoids inconsistency, subjectivity and error in current management practices and illustrates the science best suited for achieving sustainability through examples of research that address specific management questions (Fowler, 2009:3).

In order to address the research question, the researcher used the systemic management theory to identify systems currently used by schools to manage EE projects and to determine high-priority problems through analysing the causes of barriers to managing EE projects in schools. Through the use of open-ended questionnaires, the research obtained the information regarding the performance of

school principals and educators when managing EE projects and possible solutions to the identified barriers.

Systemic management theory is an approach to management that focuses on the management process rather than on the final outcome. The concept of systems theory was mainly concerned with equilibrium and stability, and their maintenance through control of negative feedback (Montuori, 2000: 66; Byeon, 2005: 223; Foster, 2005: 877). The systems concept views organizations as constantly interacting with their environment. The organizational environment is comprised of a set of relationships between agents or stakeholders and other factors that may be beyond the control of the organization (Mason, 2007: 10)

In managing EE projects, schools should establish relationships with other organisations in order to get assistance in managing the projects when factors beyond their control prevail. School principals should develop communication systems that enable them to liaise with relevant stakeholders who will share knowledge and expertise. The role of management leadership 'principals' can encourage practices and behaviour that lead to superior quality performance of staff in managing the EE project in schools. (Anderson et al., 1995; Flynn et al., 1995; Sara et al., 1989).

The concept system entails a set of two or more elements whereby the behaviour of each element has an effect on the behaviour of the whole; the behaviour of the elements and their effects on the whole are interdependent. While subgroups of the elements all have an effect on the behaviour of the whole, none has an independent effect on it (Skyttner, 1996: 7). In managing school EE projects it is essential that behaviour of school principals and educators should influence other participating stakeholders in seeing EE projects as an essential activity to be carried out for the benefit of the school and the environment at large.

Henri Fayol (2011:13) states that planning; organising, commanding and coordinating are essential elements of managing projects. As indicated in total quality management by Doherty (1994:11), quality assurance is a prevention-based approach and is about products working reliably in future and about services and activities being dependable and consistent, similarly in systemic management school principals together with their educators should sit together and plan and organise the EE project as part of quality

assurance to make sure that there is dependability and consistency in managing the project.

Deming (1986:67) stated that senior leadership is critical for organisational success. The quality of management offers an effective approach to manage quality in the context of systems developed (Fox & Flakes, 1997). The school principals and educators must be able to put the plan in action, run the EE project smoothly with proper supervision, while taking charge of the factors that may cause barriers to managing EE projects by ensuring that each department has what it needs to complete a EE project.

Schools should develop systems that will encourage the relationship between the institution and external groups such as parents, employers and the local education authority. The system will assist the school to acquire knowledge, skills and support in managing EE projects (Hoy & Miskel, 1987:29).

Caldwell (1992:16-17) states that managers of the schools must be able to develop and implement systems involving six managerial functions, namely: goal setting, priority-setting, planning, budgeting, implementing, and evaluating. It is the objective of systemic management to see to it that school principals as managers are able to set goals, plan, budget, implement and evaluate the EE projects. Participants in each EE project should be divided into teams. Each team member must be given a specific task to perform in an activity. After the activities of EE project are completed the teams must debriefed to ascertain what they know about their team's environment with respect to the EE project.

Planning is required in order to put systems in place. Making a plan of action that involves the entire school is essential when establishing EE projects. Proper planning eliminates the issue of complexity. Too many variables that can cause barriers to managing the EE projects must be eliminated. The manner in which the school organises the EE projects is a fundamental issue since it impacts on how well the project is run.

EE projects must be organised in such a manner that everything runs smoothly and efficiently. In order to eliminate barriers to managing EE projects, a breakdown of job functions into smaller units is required, with increased supervision and guidance for each participant. Arrangement of activities to promote collaboration between different areas of the EE project must be described in order to achieve the EE project's purpose. It is essential for the school to discuss any strategic uncertainty about the EE project and any strategic direction must be clear.

The operational changes to be made in carrying out the EE project must be discussed. In other words, if existing ways of dealing with the EE project are inappropriate, the school must deal with it. The school principal must take a commanding position in managing EE project. He/she should take charge of the EE project in a way that is beneficial to the school. He/she must be in a position to clear any relational confusion that can contribute to barriers in managing EE projects.

The principal must make sure that he/she coordinates the EE project well by ensuring that each department has what it needs to complete a task. Externally induced change must be dealt with. These are unexpected external influences causing change within the operational processes of the EE project, generating a greater sense of uncertainty amongst school educators, subject facilitators and IDSOs.

4.5   THEORETICAL FRAMEWORK OF THE STUDY

Based on the preceding discussions, the theoretical framework which underpins this study is total quality management. The reason for opting to use it, is because its philosophy is evident in various quality management systems. TQM in school EE projects examines the aims, content, resourcing, levels and projected outcomes of the project. It facilitates the setting of standards and can even be regarded as a vehicle for achieving them. Total quality management in school EE projects require quality control and feedback from educators, staff, students and even external customers involved in managing the project. In relation to school EE projects planning, implementing (operationalising), monitoring and reviewing of EE projects by school principals inspires confidence in EE educators in planning future EE projects.

Monitoring and reviewing eliminates possible errors/ barriers to managing EE projects. It thus facilitates improvement in the TQM in school EE projects.

4.6 CONCLUSION

This chapter discussed the theoretical framework of the study. The term theoretical framework was defined. It was followed by a discussion of the total quality management theory and systemic management theory respectively. The theoretical framework of the study was then outlined and conclusions drawn.

The next chapter will focus on the research methodology the researcher used in the investigation of barriers to manage EE projects in schools.

CHAPTER 5

RESEARCH DESIGN AND METHODOLOGY

5.1   INTRODUCTION

The preceding chapter outlined the theoretical framework of the study, consisting of the total quality management theory and the systemic management theory. This chapter is directed at the research methodology of the study in order to fulfil the aim of the study, which is to explore barriers to managing EE projects in Alexandra Township primary and secondary schools. The issues of trustworthiness as well as ethical considerations are also outlined.

According to Giddings and Grant (2006:17), research methodology refers to the theoretical assumptions and principles that underpin a particular research approach and guide how a researcher frames the research question and decides on what process and methods to use. Krauss (2005:759) adds that methodology identifies the particular practices used to attain knowledge. In addition, Kirshenblatt (2006:76) states that research design refers to the overall strategy that one chooses to integrate the different components of the study in a coherent and logical way in order to effectively address the research problem. Furthermore, it is also noted that, research design constitutes the blue print for the collection, measurement and analysis of data.

5.2   THE RESEARCH PARADIGMS

Guba and Lincoln (1994:107) maintain that a paradigm is a set of basic beliefs people subscribe to and accept without questioning. According to Babbie (2010:33) a paradigm is a fundamental model or frame of reference used to organize observations and reasoning. De Vos, Strydom, Fouché and Delport (2011:513) define a paradigm as a pattern containing a set of legitimised assumptions and a design for collecting and interpreting data. As basic beliefs and by virtue of being grounded in peoples' philosophies, these paradigms are based on ontological, epistemological and methodological assumptions that play a major role in the researcher's paradigmatic view.

Ontological questions are concerned with the nature of existence, of what is there, the general features of what is there and reality. Epistemology poses the questions of how reality can be created and thus known; the relationship between the knower and what can be known; the principles that guide the process of knowing; and the possibility of the process being shared or repeated by others to assess the quality of research and the reliability of research findings (Vasilachis de Gialdino, 2009:2). Methodological questions focus on how the inquirer can go about finding out what can be known.

Positivism, interpretivism and critical theory are some of the paradigms which researchers reflect on when they conduct research (McMillan & Schumacher, 2010:5). All paradigms differ in terms of definition, characteristics and objectives (Nieuwenhuis, 2007; McMillan & Schumacher, 2010; De Vos et al., 2011:9).

Interpretivism constitutes the frame of reference of this study. It focuses on studying and understanding society and emphasis on reasoning as the highest potential in human beings. It is through reasoning that people are able to identify phenomenon, analyse, criticise, challenge,   and change the nature of society through reasoning (De Vos et al., 2011:9). The total quality management theory which underpins this study is interpretivist. It identifies and highlights the weaknesses of a school which relies on its stakeholders to manage EE projects by analysing, criticising, challenging and also changing the nature of society through reasoning. It advocates a change in school principals and educators systems of managing environmental education projects and promotes active participation, critical thinkers, and problem-solvers of existing environmental problems for future generations locally and globally.

Next, is the table that illustrate paradigms

Table 5.1. Summary of the four main research paradigms

Characteristic	Positivism	Interpretivism	Critical theory
Ontology	The reality to be studied and understood is out there.	Realities are apprehendable in the form of multiple, intangible mental constructions. The realities are socially and experientially based.	Objective reality and believes that there is a true consciousness out there. The task of the critical theorist is to raise people to a level of true consciousness.
Epistemology	Rationalistic view of knowledge; knower is distinct from the known.	Knowledge is socially constructed. The researcher and participant interact in the attribution of meaning.	Reason is the highest potential in human beings. Subjectivity as inquiry acts are intimately related to the inquirer's values. People use reasoning to criticise, challenge and change the nature of a society.
Methodology	Quantitative: Experiments, quasi experiments, surveys, correlational studies. Hypothesis.	Qualitative: Dialogic and dialectical, systemic procedures.	Qualitative : Encourages participants to be free and to give their perspectives of their own situation and the world they live in.

Beliefs	One *truth, objective.	Many truths, multiple realities, different people have different experiences.	Features of the real world are apprehended. False consciousness and oppression of the people are exposed. People act in order to transform their environment and their world.
Products	Facts, theories, rigid rules, laws and predictions.	Narratives, interpretations, Reconstructions.	Dialogue, active participation, judgements, transformation.

This study is rooted in the interpretivist paradigm as it is more concerned about exploring and explaining school principals, educators' experiences, perceptions and attitudes in managing environmental education projects in schools. The study also challenges and criticises the current EE project management system in which school depends on stakeholders to manage EE projects. From a interpretivist approach stance, EE projects bring awareness about environmental issues and enable the learners to gain knowledge and skills that can be shared with community and also usez to prevent Mother environmental issues in the future.

The study focused on the in-depth understanding of the implementation of EE projects in schools, identifying key stakeholders and hier roles as well as their competencies, not excluding the challenges that schools are faced with when managing the EE projects. The researcher's intention is to draw information from the participants which will indicate the truths and realities in terms of managing EE projects in South African Township schools, particularly Alexandra.

5.3   RATIONALE FOR EMPIRICAL RESEARCH

 The concept 'empirical' is derived from the Latin word *empiric* (us), which means 'experienced' (Slife & Williams, 1995: 67). From the meaning it could be stated that empirical research is the systematic inquiry that is designed to collect and analyse data using the sense organs of hearing, speech, sight, touch and smell. The information that is collected in the above manner is used to predict and understand an educational problem or to answer an educational research question. This interpretation of empirical research shows that it rests on observation and experience as means of data acquisition and interpretation. Bassey (1999:40) states that empirical research is the process where questions are asked and observations made of events by researchers using their senses to collect data. This process of asking questions brings an interaction between the researcher and participants. David and Sutton (2004: 363) define empirical research as the "collection of data by various means rather than by drawing conclusions only from manipulation of theoretical propositions". Qualitative research is one of various approaches followed in empirical research (Lebeloane, 2004: 38).

Managing EE projects is the prerogative of the school principal and the EE subject educators in schools. However, studies indicate that most educators are not trained in managing EE projects. Martins and Martins (2008:380) state that the school managers should create a culture that sets high levels of commitment and performance, creating stronger employee knowledge of managing EE projects and commitment to the school.

In addition, not enough is known by school educators on how integrate EE projects into other curriculum subjects. Gebreab and Bak (2000:10) indicate that there is a severe shortage of skilled teachers able to integrate EE effectively into the educational programme. Lack of skilled teachers is a barrier in managing EE projects in schools. The researcher conducted participatory observations in order to collect data (field notes and photography) and validate data collected through the use of open-ended questionnaires. It is evident that educators have no time for EE projects and they show lack of interest as there is minimal support from school management and district officials. According to Symons (2008: 5), time and money, lack of priority given to the project, a knowledge gap, and lack of training for principals and educators, are some of the barriers to managing EE projects in schools.

5.4   RESEARCH DESIGN

Research design is a plan, structure and strategy of the investigation, so conceived as to obtain answers to a research question. The purpose of the research design is to achieve greater control of variables, thus improving the validity of the study in examination of the research problem. Blanche and Durrheim (1999:29) defined research design as a strategic framework for action that serves as a bridge between the research questions and the execution or implementation of the research. According to Niewenhuis (2007: 70), a research design is a plan or strategy that moves from the underlying philosophical assumption to specifying the selection of participants.

According to Van Manen (1990:163), there are five qualitative approaches to inquiry, namely narrative research, phenomenology, grounded theory, ethnography, and case

studies. In this case study, qualitative research was used to explore barriers to managing EE projects in schools. The rationale for embracing a case study design originated from the desire to comprehend the quality of managing EE projects in schools.

The ontological position of this study as illustrated by Alverman (1991:14) states that, quantitative research can suggest 'what works' but qualitative research can give us insights into why, how, and with whom it works. Ontological questions are concerned with the nature of existence of what there is, the general features of what there is and reality. Therefore, meaning of an experience, event or emotion is constructed by people in their everyday living; in this case, school principals, educators, subject facilitators and IDSOs' experiences of managing EE projects, how they manage, what works and possible solutions are to be explored.

A qualitative approach was opted for on the basis that it is also characterised by a multiple-methods approach and of a holistic, inductive and generative nature (Silverman, 2000:13). An important facet in qualitative research is the opportunity to develop new ideas that are empirically supported. The research has relatively longer time to systematically observe, interview and record processes as they naturally occur (McMillan & Schumacher, 2006:78) involving an interpretive and naturalistic approach (Denzin & Lincoln, 2000:17). McMillan and Schumacher (2010:5) identify positivism, interpretivist and critical theory as the basic research paradigms researchers bring to research. Interpretivist stands in opposition to positivism and maintains that there are many truths and multiple realities and is associated with methodological approaches which provide research participants with the opportunity to raise their voices, concerns and practices in order to be heard. Critical theory shares characteristics with interpretivism by focusing on studying and understanding society but it puts more emphasis on reason as the highest potential in human beings and through reasoning people is enabled to criticise, challenges and change the nature of a society (De Vos et al., 2011:9).

The total quality management theory and systemic management theory which are the underpinning theories of this study highlight the weakness of management of school principals in managing EE projects. School principals are unable to control educator's

unwillingness to integrate EE projects in curriculum subjects. No system is in place at school to guide educators on how to manage EE projects. The experiences, perceptions and attitudes of the school principals, educators, subject facilitators and IDSOs on managing EE projects in schools is of concern in this study, hence the application of interpretivist paradigm. In addition, the manner in which schools plan, organise, coordinate, integrate EE into other subjects and manage EE projects is also subject to application of interpretivist paradigm. The study therefore focuses on an in-depth understanding of barriers to managing EE projects in schools. The research intentions are as follows: conducting participatory observation in Alexandra Township primary and secondary schools with the intention to take field notes and photographs relevant to EE projects in schools and thereafter, to collect data through the use of open-ended questionnaires and participant observation.

5.5   RESEARCH APPROACH

Research approach is a logical plan for getting from here to there, where here is considered as the initial set of questions to be answered, and there is a set of answers to the questions (Yin, 2009:26). Methodology is the procedures by which researchers go about their work of describing, explaining and predicting phenomena. It is also defined as the study of methods by which knowledge is gained. Research methods help researcher collect samples, data and find a solution to a problem. Research methods help us get a solution to a problem. On the other hand, research approach is concerned with the explanation of the following: Why is a particular research study undertaken? How did one formulate a research problem? What types of data were collected? What particular method has been used? Why was a particular technique of analysis of data used? The study of research methodology provides us the necessary training in choosing methods, materials, scientific tools and training in techniques relevant for the problem chosen (Rajasekar, 2006:5).

McMillan and Schumacher (2010: 21) also define approach as the procedures used in conducting a study. The concept 'approach' in this study entails the procedures by which the researcher described and explained EE projects in schools. In this study the researcher gained knowledge from the sampled school principals, educators, subject

facilitators and IDSOs on barriers to managing EE projects in Alexandra Township primary and secondary schools.

The research purposes can be achieved by using any of the three research approaches typified by McMillan and Schumacher (2010:11) and Ivankova, Creswell and Clark (2007:263). Qualitative researchers are interested in understanding the meaning people have constructed, that is, how people make sense of their world and the experiences they have in the world (Merriam, 2009:13); quantitative researchers emphasize objectivity in measuring and describing a phenomenon. The quantitative researcher follows a logical model in which specific expectations according to the hypothesis formulated are developed. The focus is on numerical data rather than the views and utterances made by the research participants. The mixed method approach combines quantitative and qualitative methods with the intention of producing a more comprehensive investigation. One of the advantages of employing a mixed method approach is that the researcher can demonstrate the research findings quantitatively and also explain why such results were found.

In this study, the researcher undertook an in-depth interpretive, reflexive and analysis of how school principals, educators, subject facilitators and IDSOs manage EE projects in schools through a qualitative approach, involving a case study design which was chosen as the most suitable method to realize the aim of the study. The problem was explored using a literature review as well as an empirical investigation (Mouton, 2003:56). The literature review entailed the identification, and analysis of documents containing information relating to the stated problem. These documents comprised professional journals articles, books, and dissertations. The aim of the review of literature was to provide a theoretical framework for the empirical investigation made globally and locally. It was also made on the assumption that schools have EE projects and therefore it is assumed that educators are able to integrate EE in other curriculum subjects and principals are also able manage them.

5.5.1   Qualitative research approach

Qualitative research methods are associated with inductive approaches based on empirical evidence. Saks and Allsop (2007: 24) state that, qualitative research is

defined as a research approach that uses real-life situations and experiences in order to analyse, synthesise and give meaning to the events that take place in the environment.

Slife and Williams (1995: 234) defined qualitative research approach as "procedures for investigating human actions that do not involve measurement and quantification, but allow subjects to describe their own behaviour and experience". De Vos, Strydom, Fouché and Delport (2003:271) also emphasize that the qualitative method of a research is important as the whole research process enables a researcher to conceptualise a problem to write using a narrative style. In this study, the researcher used the qualitative research method to conceptualise the barriers to managing EE projects in schools and used a narrative text to elucidate the experiences that the participants had in order to analyse, synthesise and give meaning to the solutions thereof.

McEwan and McEwan (2003: 79) state that 'qualitative researchers are focused on explaining and interpreting what they observe, hear and read'. It is an approach in which researchers are concerned with understanding the meaning which people attach to their experiences or phenomenon within their society (Ritchie & Lewis, 2003).

The data from observation consists of detailed descriptions of program activities, participation behaviour, staff actions and the full range of human interactions that are usually a part of the programme experiences (Patton, 2002). The researcher conducted participatory observation, whereby field notes and photographs were taken. Data was collected using open-ended questionnaires in order to determine barriers to managing EE projects in Alexandra Township primary and secondary schools. This is also supported by Elliott (2005:26-27) who stated that the qualitative approach allows the researcher to create a deeper and richer picture of what is going on in a particular setting.

The researcher did not interrupt in the answering of the open-ended questionnaire as he intended to give the participants the freedom when answering questions. (Henning, 2007:3) The researcher intended to draw on first-hand knowledge and experience that school principals, educators, subject facilitators and IDSOs have about the barriers to

managing EE projects. This sums up the explanation given by Flick (2006:17) that indicates that "the qualitative approach puts emphasis on the knowledge and practice studied at local level".

According to McMillan and Schumacher (2006:315), qualitative research is "an inquiry in which researchers collect data by interacting with the selected persons in their setting (e.g. field of research). Qualitative research describes and analyses peoples' individual and collective social actions, beliefs, thoughts and perceptions. The research question: "What are the barriers to managing EE projects in Alexandra Township primary and secondary schools?" provided the focus for this study.

Creswell (2003:104-105) states that qualitative research is undertaken with the aim to explore, discover, develop and understand, describe and report. A qualitative method is used to determine, to describe or/and to understand how people experience and cope with the world or specific aspects of the world within their specific context. Qualitative research aims to get a better understanding through first-hand experience, truthful reporting, and quotations of actual conversations. It aims to understand how the participants derive meaning from their surroundings, and how their meaning influences their behaviour.

In this study, the aim of using the qualitative approach was that of gaining understanding of how EE projects are managed in schools and to generate data about barriers, causes and possible solutions to managing EE projects in Alexandra Township primary and secondary schools (Henning, 2007:3).

Wright (2012:3) states that qualitative research focuses on the use of an inductive form of reasoning, develops concepts, insights and understanding from patterns in the data. It uses an insider perspective to derive meaning from the participant's perspective. In this study, the researcher condensed extensive and varied raw text data into a brief, summary in order to establish links between the research objectives and the summary findings derived from the raw data.

According to Strauss and Corbin (1991:17), "qualitative research produces findings which are meaningful, testable and scientifically free from contradictions." The

researcher collected data by means of using open-ended questionnaires and participatory observation in order to report reliable and valid findings that are meaningful, testable and scientifically free from contradictions on barriers to managing EE projects in Alexandra township primary and secondary schools.

5.5.2   Research population

The study population is the aggregation of elements from which the sample is selected and every element with the same characteristics has the chance to be selected for the sample. Muvirimi (2002:44) indicates that in research one can study a small group to show something about a large group of individuals. A research population is also known as a well-defined collection of individuals or objects known to have similar characteristics. Population is defined as the target group the researcher intends to study (Tobias, 2006:25). Polit and Hungler (1999:278) indicate that eligibility criteria specify the characteristics that people in the population must possess in order to be included in the study. In addition, Polit and Hungler (1999:43, 232) further indicate that population is the totality of all subjects that conform to a set of specifications, comprising the entire group of persons that is of interest to the researcher and to whom the research results can be generalised.

The population considered in this study is the primary and secondary schools in Alexandra Township and the Johannesburg east district. The population was relevant to the study since they deal directly with EE project management in schools and they are educators and district officials who oversee the management of EE projects in schools. This is also supported by Cohen and Morrison (2002) who indicate that population is the group of interest to the researcher, the group to which the researcher will like the results to be generalised from.

There are two types of population in research, namely: target population and accessible population. Target population refers to the entire group of individuals or objects to which researchers are interested in generalizing the conclusions. The target population usually has varying characteristics and it is also known as the theoretical population; accessible population is the population in research to which the researchers can apply their conclusions. This population is a subset of the target

population and is also known as the study population. It is from the accessible population that researchers draw their samples.

The next section will discuss the research sampling from the population of primary and secondary schools in Alexandra Township and Johannesburg east district.

5.5.3   Research sampling

Corbetta (2003: 211) refers to sampling as a procedure through which the researcher picks out, from a set of units, the subjects of study. The term 'sampling strategy' used in this study refers to the way or manner in which individuals or participants were selected from the population. Sampling is defined as an act, process, or technique of selecting a suitable sample, or a representative part of a population for the purpose of determining parameters or characteristics of the whole population.   A sample is a finite part of a statistical population whose properties are studied to gain information about the whole (Webster, 1985:12). When dealing with people, it can be defined as a set of participants (people) selected from a larger population for the purpose of a survey.

In this study, the researcher sampled nineteen school principals and nineteen educators from primary and secondary schools, plus five subject facilitators and five IDSO's from Johannesburg east district since they are suitable and have enough information regarding EE projects management that reliable results can be generated out of and that the analysed collected data from the sampled population can represent the larger group.   The chosen samples are considered as knowledgeable and informative about barriers to managing EE projects in schools.

Sampling is categorised into probability sampling and non-probability sampling (David & Sutton, 2004:150- 152). In this study the researcher made use of convenience sampling which is a type of non-probability sampling. With convenience sampling, the samples are selected because they are accessible to the researcher. Subjects are chosen simply because they are easy to recruit. This technique is considered the easiest, cheapest and least time consuming. In this study, all the sampled participants worked in Alexandra Township schools where the researcher was working as a school

principal. The researcher contacted participants and distributed the open-ended questionnaires to the sampled participants since they were in his proximity.

In addition, the researcher did not spend unreasonable amount of money and time to conduct the research due to the convenience, accessibility and proximity of all sampled participants. Burns and Grove (1999:238) state that in non-probability sampling, every person who meets the criteria is asked to participate; it is a less complicated and more economical procedure than random sampling. In this study the researcher's judgement was used to select individual subjects who met the following eligibility criteria as stipulated in the next section that discusses the description of the participants.

5.5.4   Research site

The research site refers to the place where the data is collected. In this study, data was collected from primary and secondary schools located in Alexandra Township primary and secondary schools, subject facilitators and IDSOs from Johannesburg east district (cf. chapter 2).

5.6   DESCRIPTION OF PARTICIPANTS

School principals, educators, subject facilitators and ISDOs were identified as relevant participants for the study. They were identified in line with the South African School Act (Act No. 84 of 1996), Educator's laws amendment Act (Act No. 34 of 2005), Education labour relation council policy book (2003: c – 62-70), circular 64 of 2007 and circular 129 of 1998. The eligibility criteria of selecting the participants will be discussed in the description of participants.

5.6.1   The researcher

The researcher's role in this study consisted of executing of various responsibilities. In the instance, the researcher was a key instrument in the collection and analysis of data. The researcher's distributed the open-ended questionnaires to the participants. The researcher further distributed the consent forms to each participant to ensure that

the issues of ethical considerations were dealt with. The researcher had the responsibility of guarding against personal assumptions and avoided bias when conducting participatory observation during which time a journal with recorded observed information was created.

5.6.2   Principals

In the context of this study, principals include all those academic or professional staff who are responsible for the management of the school. According to South Africa School Act No.84 of 1996 (page 28 sections 16A), it states that the principal of the public school represents the head of the DoE and should undertake the professional management of public school. The sampled principals met the eligibility criteria of seven years' experience as an educator and three years' experience as a primary or secondary school principal. Direct data was collected from the school principals of primary and secondary schools. In this study the role of principals was to complete open-ended questionnaires on barriers to managing EE projects as a manager of the school.

5.6.3   Educators

According to South African School Act (No. 84 of 1996) the concept "educator" means any person, excluding a person who is appointed to exclusively perform extracurricular duties, who teaches, educates or trains other persons or who provides professional educational services, including professional therapy and education psychological services, at a school.

In the context of this study, educators include all those academic or professional staff that engages in class teaching which fosters a purposeful progression in learning and which is consistent with learning areas and programmes of subjects and grades as determined. (ELRC Policy, 2003: C-67). The sampled educators met the eligibility criteria of seven years' experience as primary or secondary educators who are currently teaching and should be the coordinator of EE projects. Direct data was collected from the educators of primary and secondary in Alexandra Township schools using open-ended questionnaires.

5.6.4 Subject facilitator

In the context of this study, subject facilitators are classified as office bearers at district level. The subject facilitator's duties are to facilitate curriculum delivery through support in various ways depending on the nature of responsibilities attached to the post (Education Labour Relation Council Policy, 2003: C- 68). The sampled subject facilitators met the eligibility criteria of seven years' experience as educators and two years' experience as subject facilitators. Open-ended questionnaires were used to collect direct data from the subject facilitators from Johannesburg east district 9.

5.6.5 Institutional Development Support Officer

In the context of this study, IDSOs are classified as office bearers at district level. They are also known as circuit inspectors. The ISDO's duties are to oversee, give guidance and support to the school principals on how to manage school (Education Labour Relation Council Policy, 2003: C-68). It is the responsibility of the IDSOs to develop the schools in areas of weaknesses pertaining to leadership, management and governance. In case where the principal needs support, the IDSO should facilitate specialist support required by the school in areas of weakness identified or requested by the school. Furthermore, it is the role of the IDSO to provide schools with broad curriculum support and to liaise with the schools on behalf of the district / provincial office with respect to information that may be required from time to time (Circular No. 51of 2006). The sampled IDSOs met the eligibility criteria of seven years' experience as an educator and two years' experience as an IDSO. Open-ended questionnaires were used to collect direct data from ISDOs on barriers to managing EE projects in Alexandra Township primary and secondary schools.

5.7 DATA COLLECTION METHODS

A case study approach was used in this study. According to Merriam (2009:21) a case study is regarded as an intensive, holistic analysis of single instances, phenomenon, or a social unit within a limited time scale. In this study the small group of participants entailed nineteen school principals, nineteen educators, five subject facilitators and five IDSOs. Intensive and holistic analysis of barriers to managing EE projects in

schools was conducted in order to obtain data on management of EE projects in schools. Strategies for collecting data such as observation and completing open-ended questionnaire enabled the researcher to collect data deemed relevant for the phenomenon under investigation (Nieuwenhuis, 2007:81).

Polit and Hungler (1999:267) define data as information obtained during the course of an investigation or study. In this study the open-ended questionnaire and participatory observation (field noted and taking photographs) were applied strategies to obtain data relevant to the study's aims, objectives and research question.

Strauss and Myburgh (2003:41) state that the aim of an investigation should be a yardstick for including or excluding data for a research project. The researcher must be sensitive to the phenomenon under investigation "any data that sheds light on the problem and aim under investigation should be included" (Strauss & Myburgh, 2003:41). During participatory observation, field notes and photographs were recorded and collected as data that shed light on the barriers to managing EE projects in Alexandra Township primary and secondary schools.

In collecting data, the researcher used open-ended questionnaires to collect data from school principals, educators, subject facilitators and IDSOs (cf. appendices 5, 6, 7, and 8). Seaman (1991:42) states that data collection instruments refer to "…devices used to collect data such as questionnaires, tests, structured interview schedules and checklists." Polit and Hungler (1997:446) define a questionnaire as "a method of gathering information from participants about attitudes, knowledge, beliefs and feelings". The designed open-ended questionnaire was used to gather information from participants about barriers to managing EE projects in Alexandra Township schools.

The next sections will discuss the observation and open-ended questionnaire as the main instruments used to collect data on barriers to managing EE projects in Alexandra Township primary and secondary schools.

5.7.1   Participatory Observation

According to Henning (2007:82) participatory observation is a process that "implies seeing and observing with the other senses, it may mean participating in actions of the people in the research setting and getting to know their ways of doing very well." The researcher took part in the action of managing EE projects in the school where he was a principal, so that he may acquire the first-hand information in identifying barriers to managing EE projects through seeing and experimenting during fieldwork.

The researcher, as a school principal, observed a variety of EE projects at schools, such as, the feeding scheme projects (with the aim of feeding learners from disadvantaged families); a gardening project (with the aim of growing vegetables to supplement learners' diet), and a parental skill development project (with the aim of equipping parents with job creation skills). The projects were observed for a period of one year. The observations made were recorded in the researchers' journal for the purpose of comparing findings. The intention was to identify barriers to managing the EE projects in schools. The researcher's observation on EE project management at schools triggered a question: 'How do other schools in the same area or elsewhere manage EE projects?'

According to Mouton (2008:107), in qualitative research, "the researchers tend to keep field notes as they participate in the fieldwork." The researcher kept field notes as he participated in the fieldwork. The types of EE projects that were observed in schools were photographed. Apart from the photographs, field notes focused on barriers to managing EE projects. The researcher took field notes to enrich the discussion, explanation, arguments and analysis on barriers to managing EE projects in Alexandra Township primary and secondary schools. Thus, the researcher gleaned first-hand information, knowledge and experience on barriers to managing EE projects. The participatory observation facilitated the design of a questionnaire that was reliable to obtaining data on barriers to managing EE projects in Alexandra Township primary and secondary schools. Thereby, he reduced the chances of imposing exterior knowledge for the sake of validating and providing data that is reliable.

The use of open-ended questionnaire was well-suited to gather information from individual participants without any interference from the researcher. In the next section a description of the as the main instrument used in collecting data is provided.

- **Open-ended questionnaire**

Babbie and Mouton (2001:646) state that a questionnaire is a "document containing questions and other types of items designed to solicit information appropriate for analysis in a research". In this study, the open-ended questionnaire was the main data collection instrument. The ultimate goal of this open-ended questionnaire was to collect data from school principals, educators, subject facilitators and IDSOs. The open-ended questionnaire was designed in such a way that the participants were able to understand the questions and to respond to the questions (Beukenhorst, 2012:14). The collected data are discussed in chapter 6 according to the relevant themes and categories of the questionnaire and summarised afterwards.

In this study, an open-ended questionnaire was a measurement instrument. The questionnaire was used to measure validity and reliability of this study. The need to perform reliable and valid measurements requires survey questions to satisfy two conditions, namely each participant must be able to interpret the question in the same way, and each participant must be able to understand the question the way the researcher intended (Beukenhorst, 2012:15).

Bearing in mind that it is usually hard for participants to complete a questionnaire correctly, the researcher conducted a pre-test of the questionnaire in one primary school. According to Phellas, Bloch and Seale (2011:17), the people used during the pre-testing study should be excluded from the final sample as their experience of seeing the earlier questionnaire may induce them to answer final questionnaire differently. One school principal, educator, subject facilitator and IDSO participated in the piloting of the open-ended questionnaire and were excluded in the answering of the final questionnaire. The purpose of the pre-test was to find out how the selected participants comprehended questions, retrieved the appropriate information from their memory, formed judgements about the information and responded to questions. The pilot also allowed the researcher to discover unanticipated problems with question

wording, instructions and the length of time needed to complete the questionnaire (Beukenhorst, 2012:16).

Brink and Wood (1998:293-298) state that "each respondent enters his/her responses on the questionnaire, saving the researcher's time, compared to the time required to conduct personal interviews; it is less expensive than conducting personal interviews; participants can express themselves in their own words without fear; data on a broad range of topics may be collected within a limited period; the format is standard for all subjects and is independent of the interviewer's mood".

In this study, the researcher preferred the open-ended questionnaire over interviews since he wished to give the participants the chance to express themselves without fear when answering questions. Moreover, it was advantageous to both the researcher and participants with regard to the issue of time: each participant completed the questionnaire at his or her own discretion unlike individual interviews which are costly and time consuming. Phellas et al. (2011:2) indicates that interviews are more time consuming for the researcher and interviewer bias, where the interviewer influences the replies by revealing his or her own opinions, can be avoided by self-completion questionnaires.

The questionnaires were delivered by hand to the participants, that is, school principals, educators, subject facilitators and IDSOs, to complete without the interference of the researcher. The researcher collected completed questionnaires. Although the researcher knew the names of schools and participants, he kept this confidential at all times to protect their identity.

In this study, there were four open-ended questionnaires. The first questionnaire was addressed to school principals. Its main focus was to find out the way in which school principals manage EE projects in schools (cf. appendix 5); the second open-ended questionnaire was addressed to the educators in primary and secondary schools, with its main focus on EE projects existing in schools (cf. appendix 6); the third open-ended questionnaire was addressed to the subject facilitators from Johannesburg east district, with its main focus on the assistance offered to educators on how to integrate EE in other subjects with the intention of initiating EE projects (cf. appendix 7); and

lastly, the fourth open-ended questionnaire was addressed to the IDSOs, with the main focus on how IDSOs offer assistance to school principals on how to manage EE projects in schools (cf. appendix 8). In each of the four questionnaires, questions and wording were not necessarily the same although they were related, but aimed at finding factual information on barriers to managing EE projects in Alexandra Township primary and secondary schools.

The researcher made use of open-ended questions, since they can be used to explore deviant responses (Reja et al., 2003:61). The advantages of the open-ended questions include the possibility of discovering the responses that individuals give spontaneously, and thus avoiding the bias that may result from suggesting responses to individuals. Phellas et al. (2011:4) indicate that the absence of an interviewer provides greater anonymity for the respondent. When the topic of the research is sensitive or personal, it can increase the reliability of responses. Using self-completion questionnaires reduces errors of bias caused by the characteristics of the interviewer and the variability in interviewers' skills.

In this study, the following steps were considered when designing a questionnaire, namely, deciding on the information required in the questionnaire; meaningful order and format of questions; length of the questionnaire; piloting the questionnaire and the final questionnaire (Phellas et al., 2011:17)

- **Information required in the questionnaire**

The questionnaire to be completed by the school principals and educators included the research topic, introduction, purpose of the questionnaire and the school details. Questions were based on: school EE projects; management of EE projects in schools; barriers to managing EE projects at school; causes of barriers to managing projects; and possible solutions in identified barriers to managing EE projects. (cf. Appendices 5 and 6.)

The questionnaire completed by the subject facilitators and IDSOs included the research topic, introduction, purpose of the questionnaire and bibliographic information of the subject facilitators/IDSOs. Questions were directed at subject

facilitators on their involvement in integrating EE into subjects with the aim of initiating EE projects and questions were directed at IDSOs on managing EE projects in schools, identified EE projects in schools, barriers to managing EE projects, causes of barriers to managing EE projects and possible solutions to barriers to managing EE projects in schools. (cf. appendices 7 and 8.)

- **Meaningful order and format of questionnaire**

The questionnaire was structured into two sections, namely Section A: School (biographical information of the school); Section B: questions based on research question. The format of the questionnaire was aimed at avoiding leading questions that provide only one side of the issue, making it more likely that one side will be supported rather than the other. The format of the questions allowed participants to state their own opinions; it provided a balance that would provide the participants with answer categories with an equal number of options on each side. Questions were numbered and ordered to be logical to the participants, with similar themed questions grouped together. (cf. appendices 5, 6, 7 & 8.)

- **Length of the questionnaire**

Burchell and Marsh (1992:233) believe that "it is generally assumed that questionnaire length has a significant effect on response rate. It is one of the most frequent reasons sampled members give when refusing to participate in answering a questionnaire. However, empirical findings are equivocal. One of the reasons is that various authors use different operational definitions of questionnaire length. Studies that define a number of questions and/or pages usually show a negative relationship between questionnaire length and response rates." In this study the questionnaire was short and to the point. Each questionnaire comprised the introduction and purpose of the questionnaire. Ambiguous words were avoided.

- **Piloting the questionnaire**

Piloting therefore involves the field testing and development of the formal scheme of the research that was initially elaborated to secure research funding and research access (Bloor & Wood, 2006:130-131). It is important to test the questionnaire before using it to collect data. Piloting helps to identify questions that do not make sense to participants, or problems with the questionnaire that might lead to biased answers. Piloting the questionnaire will normally identify practical problems with implementation, rather than problems with the questionnaire design (Beukenhorst, 2012:16).

The researcher made use of piloting for good planning of the questionnaire. Piloting assisted with finding the meaning of the question content, including avoiding confusion with the overall meaning of a question, as well as misinterpretation of individual terms or concepts. The sampling of the pilot has been outlined in the foregoing section. In this study, piloting provided an important means of finding out directly from participants what their problems were with the questionnaire. Some of the problems identified were: comprehending questions, responding to questions in a formal way and lacking information or relevant answers to the question. Piloting gave the researcher an opportunity to diagnose problems and revise question formulation to resolve problems. Questions that share similarities in meaning were combined to form one question, words that were ambiguous were replaced and irrelevant questions were deleted.

- **Final questionnaire**

The final questionnaire had questions that were unambiguously phrased and not misleading. Each question related directly to the questionnaire objectives, and every participant was able to answer every question. Questions were phrased in a manner that enabled all participants to interpret them in the same way.

Participatory observation and the open-ended questionnaire were the means of data collection with the aim of getting the most sought and relevant information. The information and the behaviour that was not verbalised by participants was captured through the researcher's observations. This provided essential information to facilitate

a deeper understanding of school principals, educators, subject facilitators and IDSOs' experiences on management of EE projects in schools.

The next section will discuss the data analysis obtained from open-ended questionnaires and the researcher's observation journal.

5.8   DATA ANALYSIS

In this study, the researcher examined and analysed collected data in order to gain understanding of the information, to fully describe and attribute meaning with the intention of developing credible conclusions appropriate for answering the research questions.

According to Creswell (2007:46 & 150) qualitative data analysis is an ongoing and interactive process which implies that data collection, processing, analysis and reporting are intertwined. Strauss (2003:34) indicates that data analysis is regarded as the detailed examination of data: working with data, organising, synthesising, breaking data into manageable units from the database produced from data collection. It is an act of constructing and interpreting collected data. In addition, data analysis can be described as the non-numerical examination and interpretation of observations for the purpose of discovering underlying meanings and patterns of relationships (Babbie, 2007:378).

The researcher made use of an inductive approach in this qualitative study to condense extensive and varied raw text data into a brief and to establish clear links between the research objectives and the summary findings derived from the raw data (Thomas, 2003:1). Strauss and Myburgh (2003:10-11) state that inductive reasoning includes observations made on a particular event or phenomena in a situation and then, on the basis of the observed events, inferences are made about the whole situation.

In this study, collected data was categorised according to sections. In order to render a better understanding of the differences regarding responses to questions, the percentage technique was used during results analysis. Column graphs were used to

analyse the bibliographic information of school principals, educators, subject facilitators and IDSOs. According to McMillan and Schumacher (2010:379) qualitative research discovers the relationship between the categories that allow patterns or themes to emerge from data. In this study, similar codes or information were grouped together.

Subsequently, in this study, data collected from four categories of participants, namely the school principals, educators, subject facilitators and IDSOs were coded, categorised, and themes were developed into manageable units (Strauss & Corbin, 1998:17). This is also supported by Hesse-Bibber and Leavy (2004:409-410) who describe qualitative data analysis as a process that involves extracting meaning from collecting textual materials. Coding is the analytic strategy that many qualitative researchers employ in order to locate key themes, patterns, ideas and concepts within their data. Babbie (2007:378) defines data analysis as the non-numerical examination and interpretation of observations for the purpose of discovering underlying meanings and patterns of relationships. Interpretations of the data were made on the basis of contextual information (literature review) and the theoretical framework. The researcher linked the observation and data collected from participants during the process of analysing data. Data was interpreted for the purpose of discovering underlying meanings and patterns of relationships between observation and participants' data. The main themes were noted, categorised and discussed accordingly. Walliman (2005:301) states that it is important to analyse data in order to measure, make comparisons, examine relationships, forecast, construct concepts and theories, explore, control and explain data. This analytical exercise assisted the researcher to employ an inductive mode of thinking in order to reach findings by using the themes and categories as discussed in chapter 6.

5.9   MEASUREMENT OF TRUSTWORTHINESS IN THE STUDY

According to Merriam (2009:209), it is essential to produce valid and reliable knowledge in an ethical manner when conducting qualitative research. The researcher collected data from participants and also conducted participatory observation in an ethical manner. Bryman (2012:390) indicates that there are four criteria that constitute trustworthiness of the study: credibility, transferability, dependability and

confirmability. In addition, the following desirable features "reliability, validity and eligibility" as indicated by Strauss and Myburgh (2003:55) were taken into consideration and they will be discussed next.

5.9.1   Credibility

De Vos et al. (2002:346) describe credibility as innate strong point of qualitative research that "in-depth description showing the complexities of variables and interactions will be so embedded with data derived from the setting that it cannot help but be valid. In addition, Merriam (2009:213-215) indicates that credibility is the correspondence between the way in which the researcher interprets and presents the research findings and the meanings and perspectives of the research participants.

In this study the researcher established research methods, reviewed literature and engaged sampled participants in data collection through the use of a questionnaire and thoroughly analysed the findings in order to gauge participants' perspectives. Field notes taken by researcher during participatory observation were also used to measure the credibility of the information obtained from the participants.

5.9.2   Validity, reliability and eligibility

According to Creswell (2003: 29), validity can also be ensured through content analysis technique used, a process whereby diverse perspectives of experiences of the research participants are obtained. Walsh, (2001: 15) contends that the concept validity "refers to the issue of whether the data collected is a true picture of what is being studied". This definition shows that for data to be valid it must accurately portray the reality of the phenomena being studied. The photos taken by the researcher during participatory observation validated the data recorded from the open-ended questionnaires answered by school principals, educators, subject facilitators and IDSOs.

With regard to validity of an instrument, Uys and Basson (1991:80) state that validity refers to the degree to which an instrument measures what it is supposed to measure. To ensure validity in gathering data from participants using open-ended questionnaire

(cf. appendices 5 and 6), the same questions were used to gather data from participants from principals and educators whereas, the DoE subject facilitators and ISDOs had specific questions (appendices 7 and 8). Strauss and Myburgh (2003: 57) state that the validity of an instrument is reflected by the degree in which it evaluates what it proposes to evaluate.

According to Polit and Hungler (1997: 296) and Uys and Basson (1991:75) the concept reliability implies the degree of consistency or accuracy with which an instrument measures the attribute it is designed to measure. It also implies that, the same results would be obtained if the study is to be replicated by other researchers using the same method. Strauss and Myburgh (2003:56) state that reliability can be described as the degree of consistency or stability of data collected by the same or similar instrument on occasions when it should theoretically produce the same results. A data collection instrument is regarded as completely reliable if it provides similar data when applied repetitively under similar circumstances.

The concept of eligibility was described by Polit and Hungler (1999:278) as the criteria that specify the characteristics that people in the population must possess in order to be included in the study. The selected eligible participants in this study were school principals, educators from Alexandra Township primary and secondary schools, subject facilitators and IDSOs because of their position at school as managers and educators with relevant knowledge on EE projects.

As a way ensuring validity, reliability and eligibility of this study, the findings of this research were reviewed by colleagues who are experienced in both research and qualitative research method and findings were then discussed.

5.9.3   Transferability

De Vos et al. (2002: 346) state that, in qualitative research, transferability can be challenging because of its characteristics, especially its distinctively exploratory and descriptive nature. These characteristics are usually discernible in its ability to give detailed reports about different phenomena from diverse viewpoints. According to Gasson (2004:98), transferability refers to the extent to which the reader is able to

generalize the findings of a study to her or his own context and address the core issue of "how far a researcher may make claims for a general application of their theory". In this study, sufficient contextual information about the fieldwork, such as the number of participants and the data collection methods employed in the study, were provided to enable the reader to make a transfer. The findings of this study can be easily made available to the DoE and any interested investigator whose work is related to it.

5.9.4   Dependability

Even though this study is drawn from a small number of participants from the entire education community in Gauteng province in South Africa, it is regarded as a strong sample. Cohen, Manion and Morrison (2002:78) indicate that the strong point of the research embraces the reflective and broad perception of distinctive situations, meaning that it cannot be regarded as completely dependable when a large sample is involved.

5.9.5   Conformability

Mouton (2001:17) indicates that confirmability points to the extent to which the findings of the study are the end products of the aims of conducting the research and not of the subjectivity of the researcher. Gasson (2004:93) indicates that the findings of the study should represent as far as is (humanly) possible, the situation being researched rather than the beliefs, pet theories, or biases of the researcher. In this study the research findings were confirmed by referring to the literature pertaining to barriers in managing EE projects globally and locally in chapter 3. In this study the researcher ensured that conformability is adhere to by ensuring that the findings emanate from the experiences and views of the principals, educators, subject facilitators and IDSOs who participated in this study and not his own preferences and bias.

5.10   ETHICAL CONSIDERATIONS

David and Resnik (2011:6) state that ethics are "norms for conduct that distinguish between acceptable and unacceptable behaviour…ethical norms tend to be broader and more informal than laws. Allen (2011:294) states that the integrity principle is very

important in all areas of research. Research should be transparent and subject to peer review. Cohen (2003:58) indicates that ethics in social research is regarded as a matter of principled sensitivity to the rights of others and participants are free to answer a questionnaire from their own perspective.

In this study, the researcher adhered to the professional competency and expertise which promotes the aims of the research, such as knowledge, truth, and avoidance of error. In addition, the ethical standards that promote the values which are essential to collaborative work, such as trust, accountability, mutual respect, and fairness were upheld. Throughout the research process, the research was honest, respectful and sympathetic to all participants and ensured that they are not exposed to any undue physical or psychological harm (Leedey & Ormond, 2001:97).

The importance of research ethics was stressed. The researcher was honest when recording and reporting data. The researcher was objective when collecting, analysing, and interpreting data. Care with regard to avoiding errors and negligence when examining work and keeping records of the research activities, such as data collection, was taken into cognisance.

The researcher took openness and respect for intellectual property seriously and gave credit where credit was due. By signing the consent form the participants implied that their participation in the study was not forced upon them but was the result of a conscious, voluntary decision to take part in the research study. There was no discrimination against the principals, educators, subject facilitators and IDSOs who participated in this research. The researcher maintained professional competence and expertise throughout the research. The researcher intended to minimize harm and risks to participants, and thereby maximize dignity and autonomy of all participants. Consent thus protects and respects the right of self-determination and places some of the responsibility on the participant should anything go wrong in the research (Cohen, (2002:78).

The Belmont report (2009:2-4) states that "persons are treated in an ethical manner not only by respecting their decisions and protecting them from harm, but also by making efforts to secure their well-being." In this study, beneficence, as described in

the Belmont Report, obligated the researcher to follow two general rules. The first is ensuring that the participants are not exposed to any harm, and secondly to maximize possible benefits and minimize possible harms. The researcher treated and respected the participants. The decisions of the participants with regard to the manner in which they responded and returned the questionnaires were respected.

The researcher wrote a letter to seek permission from the Gauteng DoE to conduct research in Alexandra Township primary and secondary schools, subject facilitators and the IDSOs from Johannesburg east district, (cf. appendix 1). The school management team received a letter to seek permission to conduct research with the school principal and EE committee members (cf. appendix 3). All participants signed a consent letter (cf. appendix 4).

Confidentiality (Babbie, 2010: 67) refers to a situation in which the researcher promises to keep information about the participants private. During participatory observation, field notes and photos were taken by the researcher with permission from the school managers and it was agreed that faces of the learners were to be shaded for the purpose of identity and not to cause any possible harm.

De Vos et al. (2011:118) also views privacy as synonymous with confidentiality and as far as they are concerned, it means to keep to oneself that which is not intended for others to observe or analyse. The names of schools involved were kept confidential. To observe this ethical condition, the participants were referred to as principal A, educator A, subject facilitator A, IDSO A although the identities and the names of the schools were known to the researcher.

5.11   CONCLUSION

The above discussion outlined the research methodology followed in the search for understanding of school principals, educators, subject facilitators and IDSOs' experiences and perceptions of the management of EE projects in Alexandra Township primary and secondary schools. The qualitative research design and relevant qualitative techniques for data collection were outlined. The discussion indicated how the gathered data was analysed using categorisation and interpretation.

The various measures used to ensure credibility and trustworthiness of data collection instruments as well as the data obtained were described. Ethical considerations then followed.

The next chapter presents the data analysis, interpretation and discussion of the collected data.

CHAPTER 6

DATA ANALYSIS, INTERPRETATION AND PRESENTATION OF FINDINGS

6.1   INTRODUCTION

The preceding chapter described and explained the process, rationale and purpose of qualitative research design. This chapter focuses on interpretation and presentation of findings. Attention is paid unto the analysis of captured data and the discussion of the findings. The first aspect of the empirical findings highlights the profiles of each participant. The findings are presented and supported by participants' quotations in order to answer the research questions outlined in Chapter 1. The presented findings will be discussed. The theoretical framework in Chapter 4 and the literature review in Chapter 3 provide the foundation that supports the explanation of the collected data documented in Chapter 6 and the recommendations in Chapter 7 to ensure that the research findings are supported and anchored in the literature (Bowen, 2009:33).

In this qualitative case study, data from questionnaires (cf. appendices 5, 6, 7, & 8) and the participatory observations were analysed and interpreted. Appendix 5 contains the questionnaire completed by principals from thirteen primary schools and six secondary schools; appendix 6 is the questionnaire completed by educators from thirteen primary schools and six secondary schools; appendix 7 is the questionnaire completed by five subject facilitators; and appendix) was completed by five IDSOs.

Findings are presented in a qualitative manner in line with the objectives of the study in order to answer the main research question, namely: What are the barriers to managing EE projects in Alexandra Township primary and secondary schools? Data obtained from the questionnaire were used to substantiate the findings. Information obtained from the literature review in chapter 3 was used to guide, support and to anchor the discussion. Total quality management and systemic management theories underpinning the study were used as discussed in chapter 4.

The first aspect of the empirical findings outlines the profiles of schools principals, educators, subject facilitators and IDSOs. The findings were then presented and

supported by the quotes from the participants and literature reviewed in order to answer the research question. For the purpose of validating and reliability of the findings, Inductive approach was used for the systemic review of the information.

The next section presents the analysis of empirical data.

6.2   ANALYSIS OF EMPIRICAL DATA

According to Schwandt (2007:6), data analysis is the activity of making sense of, interpreting and theorizing data that signifies a search for general statements among categories of data. In this regard, it implies that analysing data in this study required the application of inductive logic. The use of interpretivism (cf. chapter 1) which involves deduction from the data obtained relies more on what it feels like to be a participant in the action under study, which is part of the qualitative research. This study employed the qualitative approach (cf. chapter 5).

The researcher examined and interpreted data obtained from questionnaires and from observations for the purpose of discovering underlying meanings and patterns of relationships (Babbie, 2007:378). The three approaches to inductive reasoning were taken into consideration, namely: coding and categorising raw information; content analysis in which coding starts with theory or the relevant research findings and the researcher creates themes from data and lastly the summative content analysis which includes counting words as its starting point and continues to include latent meaning and themes (Hashemnezhard, 2015:60; Hsieh & Shannon, 2005:128)

In this study, the research findings are presented under themes that were captured from the recurring patterns in the data in order to reduce the vastness of information collected through the questionnaire and observation. The following themes and categories that emerged under them were used to analyse, interpret and present findings of this study, namely: EE projects in schools; management of EE projects in schools; possible solutions to managing EE projects in schools; assistance offered by district officials to managing EE projects in schools.

Firstly, the profiles of the participants will be discussed.

6.3 PROFILES OF THE PARTICIPANTS

The sample of this research study consisted of 48 participants: thirteen primary school principals, six secondary school principals and thirteen primary educators and six secondary educators; five subject facilitators and five IDSOs from Johannesburg east district.

In this study, primary schools were referred to as School A and the principals from primary schools were referred to as AP#1-13, while the educators from primary schools were referred to as AE#1-13; while the secondary schools were referred to as School B and the principals were referred to as BP#1-6. Educators from secondary were referred to as BE#1-6 and the subject facilitators were referred to as SF#1-4 plus one health and safety facilitator (HSF#1), while the IDSO's were referred to as IDS#1-5. Identities were known only by the researcher.

The bibliographical information of both primary and secondary school principals indicated that three primary and two secondary principals were teaching life orientation; one secondary principal was teaching business economics, while three primary principals and one secondary principal were teaching mathematics, two primary principals were teaching languages and four primary principals and three secondary principals were not teaching. Principals at primary schools were teaching grades six and seven classes while secondary principals were teaching grade nine and twelve classes.

Concerning their qualifications, nine primary principals indicated that they have a further diploma in education, three have the BEd degree and one has a Masters of Education degree. Concerning the secondary school staff, four had a further diploma in education, one had a B Ed and one had a MEd degree.

Teaching experiences of principals at primary level is as follows: six had 14 years, four had 17 years and three had 19 years. At secondary level, one had 25 years, two had 19 years, three had 14 years and one had 12 years.

As far as EE committee coordinators are concerned, thirteen primary schools indicated that they do have coordinators, including the six secondary school principals.

The bibliographic information of primary educators indicated that six educators were teaching life orientation, three were teaching maths, three were teaching natural sciences and technology, and two were teaching social sciences. In the secondary schools, one educator was teaching life orientation, two were teaching maths, one teaching social sciences, one was teaching tourism and one was teaching technology. Ten of the primary educators and four of the secondary educators indicated that they have a further diploma in education, while three primary and two secondary educators indicated that they have BEd degrees. Two educators at primary had 14 years teaching experience, while two had 17 years and nine had 22 years. At the secondary level, one educator had 14 years, one had 8 years and four had 17 years' teaching experience.

The bibliographic information of the subject facilitators and IDSOs highlighted that each subject facilitator is responsible for one subject. The subjects involved were, tourism, languages, social sciences, and technology. One subject facilitator (A) is also responsible for school health and safety. Three subject facilitators indicated that their highest qualification is a B Ed Honours degree, while the other two have a diploma in teaching and advanced certificate in teaching respectively. Three subject facilitators had 17 years' teaching experience, while the other two had 24 years' teaching experience.

The role of subject facilitators is to equip school educators with knowledge and skills on how to teach and assess learners, while the IDSO's are responsible for mentoring school principals on how to manage the school and its activities (cf. chapter 5). With regard to the IDOS's, two of them indicated that they are each responsible for fifteen schools in the Johannesburg east district, while three indicated that they were each responsible for thirteen schools. Two have Master of Education degrees as their highest qualification and three have a B Ed Honours degree as their highest qualification. Four had over 20 years teaching experience, while one had 17 years teaching experience.

The bibliographic information outlined above clearly indicates that the participants, namely, the school principals, educators, subject facilitators and IDSOs, are well qualified. The schools identified for this study have educators and school principals who are teaching curriculum subjects that have EE themes integrated in them. It is also evident from the school principals that each school has EE committee coordinator. However, Johannesburg east district has only one facilitator who is allocated to oversee school health and safety issues.

Next is table 6.1 that summarises the participants' biographic information.

Table 6.1: Participants' biographical information

Participants	No. of participants	subjects taught	Grades	Highest Qualifications	Experience	EE committee coordinators
(AP#1-13) Primary school principals	13	3= teaching Life orientation 3= teaching Maths 2= Languages 4= Not teaching	6 & 7	9= Further Diploma In education 3= BEd 1= MEd	6= 14 years 4= 17years 3= 19 years	13
(BP#1-6) Secondary school principal	6	2= teaching life orientation 1= Business economics 1= teaching Maths 3= Not teaching	9 &12	1=Med 4=Further Diploma in education 1= Bed	1=25 years 2=19 years 3= 14 years 1= 12 years	6
(AE#1-13) Primary school educators	13	6= life orientation 3= Maths 3= Natural Sciences & Technology 2= Social Sciences	Grade 4-7	10= Further Diploma In education 3= BEd	2= 14 years 2= 17years 9= 22 years	13

(BE#1-6) Secondary school educators	6	1= life orientation 2= Maths 1= Social Sciences 1= Technology 1= Tourism	Grade 8-12	4= Further Diploma In education 2= BEd	1= 14 years 1= 8 years 4= 17 years	6
(SF#1-4) Subject facilitators & (HSF#1) Health & Safety facilitator	5	1= Tourism 1= Languages 1= Social Sciences 1=Technology 1=School health & safety	Primary and secondary schools	3= BEd 2= Advance certificate In education	3= 17 years 2= 24 years	**Responsibilities** -Mentoring educators -Supervising educators
(IDS#1-5) IDSO's	5	No subject allocation, but oversees management of curriculum & implantation	Oversees the admission of learners	2= Med 3= BEd	4= 20 years 1= 17 years	**Responsibilities.** Managing and supervising principals

From the provided information, it is evident that educators of each participating school in Alexandra Township, are well qualified professions and most of them have many years of teaching experience. The officials from district have adequate experience and relevant qualifications. It is also evident that schools are offering subjects that can be integrated to environmental education. The researchers' opinion is that EE projects exist in schools due to the integration of EE in other curricula subjects, since EE is not mentioned in any of the participating school as a standalone subject.

Next, the findings from the open-ended questionnaires as well as the participant observations are discussed.

6.4   PRESENTATION OF EMPIRICAL FINDINGS

The aim of this study was to investigate barriers to managing EE projects in Alexandra Township primary and secondary schools. The analysis of the open-ended questionnaires' data and the observation made by the researcher are characterised by factors that emerged from themes. Themes and categories are summarised in tabular form illustrated below.

Table 6.2: Classification of themes and categories

THEMES	CATEGORIES
Nature of EE projects in schools	• Vegetable garden EE project • Recycling EE projects • Clean-up/sanitation campaign EE project • Bontle ke Botho EE project • Integrated school health EE project • Baswa le Metsi EE project "youth and water project" • Safe playground and violence prevention EE project • Feeding scheme EE projects
Management of EE projects in schools	• Barriers to managing EE projects in schools • Causes of barriers to manage EE projects in schools

Possible solutions to managing EE projects in schools.	• Role of school management and stakeholders • Position of educators in EE projects
Assistance offered by district officials to managing EE projects in schools.	• Role of subject facilitators in EE projects • Role of IDSOs

6.4.1 Themes emerging from EE project empirical research

The themes which emerged from the principals, educators, subject facilitators and IDSOs' responses were Nature of EE projects in schools, management of EE projects in schools, possible solutions to managing EE projects in schools and the assistance offered by district officials to managing EE projects in schools. The themes and categories are discussed in the subsequent paragraphs.

6.4.1.1 Theme 1: Nature of EE projects in schools

This theme, nature of EE projects in schools, is centred on the availability of EE projects in primary and secondary schools. School principals, educators, subject facilitators and IDSOs' generally seem to be interested in having EE projects in schools, despite the challenges they encounter in managing them. The following categories emerged: vegetable garden EE project, recycling EE projects, clean-up/sanitation campaign EE project, Bontle ke Botho EE project, integrated school health EE project, Baswa le Metsi EE project, safe playground and violence prevention EE project, and feeding scheme EE project. During the discussion of these categories, the following issues were examined: the purpose for the establishment of the EE project, whether the project is school-based or non-governmental organisation initiative, and whether the EE project is unique or common in primary and secondary schools under study.

Although EE is an integrated subject and not a stand-alone subject in the curriculum, school principals, educators, subject facilitators and IDSOs indicated that Alexandra

Township primary and secondary schools have EE projects. This statement is supported by the following EE projects found in the thirteen primary schools and six secondary schools as outlined in participants' responses to the open-ended questionnaires.

Category: (i) Vegetable Garden EE Project

About ten primary principals (AP#1-10) and four secondary school principals (BP#1-4) indicated that their school has a vegetable garden EE project. This was also confirmed by ten primary educators (AE#1-10), four secondary educators (BE#1-4), five subject facilitators (SF#1-5) and five IDSO's (IDS#1-5). This is illustrated by the statement mentioned by one of the principals, who indicated that:

"The purpose of establishing vegetables garden is to supplement the food supplied by Gauteng DoE as part of nutrition programme in schools." (Principals AP# 1)

Principal's views regarding gardening in Alexandra Township is around supplementing food under national school nutrition programme and had nothing to do with integration of gardening with curriculum subjects. According to Skelly and Bradley (2000) school educators used gardens for EE to help students learn better through experimenting in USA (Florida). Educators also had love for gardening and that encouraged students to spend more time on gardening subjects in the classroom. The fact that, gardening has been isolated from teaching and learning indicate that the involvement of teachers in managing the project is minimal. If the gardening EE project was born out of a lesson in class, educator 's' and learners will have the ownership of the project and that could contribute towards good management of the project.

In addition, a principal from secondary school also indicated that "vegetables from the garden supplement nutritional diet of learners" (BP# 4)

The comments by secondary school principals demonstrate the need for vegetables as part of nutritional diet to learners although vegetables do not necessary replace other nutrients required in learners' bodies. According to Muehlhoff and Boutrif (2010), School gardening as an environmental education project in Canada is regarded as

something that cannot single-handedly raise the level of children's health or substitute for school meals, but it contributes towards nutrition programme. Garden activities should be supported by classroom lessons.

"Vegetables gardens are of necessity in our schools since the enrolment number of learners always increase after the registration of learners date passed. Principals are left with the burden of feeding a huge number of learners with inadequate supplied food by GDE." (IDS#1).

The observation made by the researcher support the IDSO's views indicated above. The shortage of vegetables supplied in a school is a result of the amount allocated for national school nutrition programme which is ring-fenced and based on the previous year's learners head count. The unfortunate part of it is that the number of learners in Alexandra township increases and outnumber the previous year's head count annually. This reduces the allocated budget and makes schools to function at a deficit. According to Gay, Mills & Airasian (2009), in some instances orphans and vulnerable children are given vegetables produce from the food garden to take home

"We prefer to plant fast growing vegetables such as spinach, cabbage, carrots and onions for a quick harvest." (Educators AP#1)

Vegetable garden EE projects are an initiative of primary and secondary schools. The aim of vegetable garden EE project in schools is to feed learners. This is a common EE project in primary and secondary schools since it exists in ten primary schools and four secondary schools.

"We also have a problem of lack of water, infertile soil, seeds, pets, security and poor commitment in growing vegetables that can feed learners" (Educators BE#2)

The researcher's observation bear witness of the seriousness shortage of water in schools to irrigate vegetables in their gardens. Those schools without a food garden also cited issues of the lack of land, poor soil, and lack of seeds, pests, no fencing, and no committed volunteers as reasons for not succeeding.

Principals of the participating schools gave permission to the researcher to take pictures. Hence, these vegetable gardens EE projects in schools are supported by the photographic picture taken by researcher during participatory observation. See attached photograph (figure: 6.1).

Figure: 6.1. An example of a vegetable garden at one of the schools involved in this study [source: A.S. Mawela**]**

The observation made by the researcher also supports the existence of gardening EE projects, although schools only have limited land available to plant vegetables. The above photograph indicates how the school has successfully planted vegetables in tyres. This is further illustrated by the following statement:

"I so wish that the government can allocate more land for the school to plant more vegetables." (School Principal AP#8)

Nonetheless, principals find it difficult to manage vegetable gardening project in schools due to barriers such as lack of land to plant vegetables. Alexandra Township is just over 800 hectares, or 1 square mile, or 7.6 square kilometres and is very well located being close to the centre of Johannesburg and near to main travelling routes. In this 1 square mile area we find approximately 350 000 people, (Wilson, 2012).

"I noticed that, in our school educators focus on subjects that are examinable and also seem not to have knowledge of integrating EE in their subjects, hence they are reluctant to can even start vegetable gardening" (School Principal AP# 6)

According to Graham & Zidenberg (2005) in USA (California), principals indicated that some of the factors that most limit the combination of classroom instructions with gardening were lack of time, funding, staff support, and curricular materials linked to academic standards and lack of teacher knowledge, training, experience and interest in gardening. This means that, orphans and vulnerable children are deprived of receiving vegetables produce from the food garden to take home, (Gay, Mills & Airasian, 2009).

Category: (ii) Recycling EE projects

The findings from thirteen primary school principals (AP#1-13) and six secondary school principals (BP#1-6) indicate that their school have recycling EE projects. In addition, seven primary educators (AE#1-7) and three secondary educators (BE#1-3) supported the statement made by principals on the existence recycling EE projects in their schools. The following statements supported the existence of recycling EE projects in schools.

"We have started recycling EE project in order to combating littering within and surrounding school premises, more especially where hawkers are selling." (Principals AP# 4

According to Moczygemba, (2001), waste and recycling projects are common in American schools. The average American produces four pounds of trash per day. The school also contribute to huge quantity of trash produced in a day. In Canada recycling project is meant to generate income to the school. Schools have areas of focus when recycling such as, recycling writing instruments, collecting batteries and or electronic equipment's such as old cell phones and computer parts. However in some of the schools in Alexandra township schools, the aim of recycling in mainly to keep school and its surrounding environment clean.

"Our aim of recycling EE project is to generate funds for the school in order to meet other needs of the school." (Principal AP#7)

"Our schools depend on non-governmental organisations such 'Alexandra Renewal project to combat the problem of littering our school vicinity." (Educators AE#5)

It seems as if, for recycling project to function or managed well in most schools in Alexandra Township, there should be an involvement of non-governmental organisation. Nonetheless, Australian schools seem to share similarities with regard to this matter. In Australia, Waste Wise Schools was the first Australian whole school environmental education program integrating teacher professional development and learning, practical tools and resources, and a structure and process for creating a Waste Wise culture across the whole school from classroom to operations and administration, (Cutter-Mackenzie, 2010).

"We wish to have proper dustbins where we can easily separate or categorise rubbish such as plastic, glasses, cool drink cans and tins." (Educator AE#7-9 & BE#2-3)

According to the (clean-up Australia, 2009), Clean-up Australia encourage schools to recycle as their initiative for the Triple Bin Challenge. The 'Triple Bin' system refers to the three colours often seen for recycling (for example; Red for Rubbish, Yellow for Plastic and Aluminium Containers, Blue for Paper). Emphasising the colour system is a fun way for children to learn and adopt recycling behaviours. This type of initiatives indicate the involvement of educators and learners in managing the recycling EE project.

"We do have number of schools that have recycling EE projects, even though there are certain challenges that need to be addressed." (IDS#3)

The statement mentioned by IDSOs confirmed that recycling projects run in certain primary and secondary schools in Alexandra Township. Schools have different purposes for initiating recycling EE projects as illustrated above. In other schools the recycling EE project is an initiative of a non-governmental organisation. Through the

permission given by school principal, the below picture taken by researcher supports the statement of educator (AE#7):

"We wish to have proper dustbins where we can easily separate or categorise rubbish such as plastic, glasses, cool drink cans and tins". (cf. figure: 6.2. below).

The issue of dustbins is indicated as a challenge that schools are experiencing as a barrier to managing recycling EE projects. The unavailability of dustbin promote littering in schools. One of the educators indicated that, it is difficult for her to start such a project without the required resources such as dustbins. The educator participant pointed the need to have:

"Colourful dustbins in all classes that are similar to the big dustbins outside, for learners to be able to separate trash" educator (AE#5).

Figure: 6.2. An example of a recycling project at one of the schools involved in this study [source: researcher A.S. Mawela]

In the researcher's opinion, primary schools are disadvantaged more in managing recycling project, since learners are still young and would like to have colourful dustbins just like Australian schools in order to associate different types of trash with a particular dustbin. Both primary and secondary school principals should be able to make initiatives of purchasing dustbins and also involving educators in integrating recycling project in their subjects in order to create active participation of learners. Schools that do not have sufficient funds should participate in non-governmental organisation for assistance.

Category: (iii) Clean-up/ sanitation campaign EE project

This is a compulsory EE project as per the instruction of MEC of Education in Gauteng province. In 2014 MEC Lesufi announced that the GDE had identified 578 schools in Gauteng in need of sanitation upgrades at a cost of R150 million. The campaign includes EE student members, EE parent members, churches and community organisations in over 20 townships in all regions of Gauteng including Johannesburg. (Refer Chapter 3: 3.4.6). The participants expressed themselves as follows:

"We prioritised the cleanliness of the school, since a healthy mind stays in the healthy body". School principals (AP# 3)

"Clean-up/sanitation campaign is highly prioritized in our school, and is one of the EE projects in our school." School Principal (BP# 4 and AE#5)

According to the world health organisation (WHO, 2004c), diseases related to inadequate water, sanitation and hygiene are a huge burden in developing countries. It is estimated that 88% of diarrhoeal disease is caused by unsafe water supply, and inadequate sanitation and hygiene. The researcher's observation indicate that water scarce in Alexandra township schools results in shortage of water to drink, sanitation, and hand washing problems. Schools with poor water, sanitation and hygiene conditions, and intense levels of person-to-person contact, are high-risk environments for children and staff, and exacerbate children's particular susceptibility to environmental health hazards.

"We are aiming at the cleanliness of school toilets, corridors and classes" (School educators. (AE#3-8 & BE# 4-5)

In Australia, According to Adams, Bartram, Chartier and Sims (2009) indicated that poor environmental conditions in the classroom can also make both teaching and learning very difficult. The effect of disease in teachers impairing performance and increasing absenteeism, also has a direct impact on learning, and teachers' work is made harder by the learning difficulties faced by schoolchildren. Namibia has about 67% which is two third of the population that is lacking improved sanitation, (De Sousa, 2014). In Zimbabwe, School children are the ones who are at most risk of poor hygiene, MDG Status Report Zimbabwe (2010).

Alexandra township schools are of no exception with regard to the problem of sanitation. Sanitation systems currently found in Alexandra include flush toilets, pit latrines, bucket latrines and chemical (portable) toilets (Census 1996). The researcher's observation indicated that learner's toilets in most schools in Alexandra Township are not regularly being kept clean, and this exposes them serious health hazards.

"The project aimed at improving schools hygiene and protecting learners from being infected by diseases unnecessarily, and the general assistance workers, employed by DoE should make the cleanliness of the schools their priority number one." (Facilitator HSF#1).

Negligence by general assistance in schools with regard to sanitation has been a compromising factor of learner's health and resulted in detrimental effects to both learners and staff. Researcher's observation indicated that, water scarcity is also a contributing factor towards sanitation problems in most of the schools in Alexandra. However schools principals together with management should come up with plans to harvest water that can be used to clean toilets.

Category: (iv). Bontle ke Botho (trans. Beautification is human) EE project

Most primary and secondary schools are striving towards making their environment beautiful, hence the establishment of this EE project. The purpose of this project is illustrated as follows:

"We are aiming at the beautification of the inside and surrounding school environment through planting trees and flowers." (Educators AE#7-12 & BE#1-4)

Due to lack of space in Alexandra Township, it is evident that, in most schools, less tress are planted within the school premises. The other challenge is, even though tree can be planted, due to the problem of water shortage, tree are rarely watered and turned to depend on rainfall for growth.

"Parents, learners and staff plant trees around the school as part of greening the school surrounding." (School principal AP#9)

The researcher has also observed that, the exercise of planting trees often took place on the 'arbour day'. This observation has been supported by comments made by health school facilitator and the IDSO's, who stated that,

"Schools engage in this project more especially during the Arbour Day." (Facilitator HSF#1). "Some of the schools in Alexandra do not have this project since there is no space to plant tree, in schools where it exists, the effectiveness of it is poor since this is only done during the arbour environmental day." (IDS#1&2)

The researcher's opinion is that many educators who might be   enthusiastic   with regard to the panting of trees project in schools might be discouraged to do so, due to lack of land to plant trees and water scarcity. Further than that, this may play a role in excluding themes that are related to this concept in their subject teachings.

Category: (v) Integrated school health EE project

This is a social and economic based EE project. This unique EE project was only mentioned by one primary school. The captured purposes and views of this project are as follows:

"This project is aiming at ensuring that learners and parents receive special health treatment for eye, ear and dental care, HIV and Aids, blood pressure, and diabetes." (School principal AP#1)

The researcher's observation indicated that the initiatives of the school to run such a project are rarely not available in most the schools in Alexandra Township. The project demands funds and medication for it to be a success. According to Nell, Meintjies, Gordon, Campbell, Andrews and Heyns (2009: 11), Alexandra has a long history of poverty and overcrowding. The unemployment rate (using a conservative definition which includes only those actively looking for work) for Alex is 32%, which is higher than that for Africans in Gauteng more generally (29%). 40% of 12 women are unemployed compared to 19% of men. For those who are employed, most work in low-skilled or semi-skilled jobs.

"The target group of people are learners and parents from disadvantaged economical background, even though all staff members are also treated on the day." (IDS#1)

The researcher was given permission by school principal to take the picture as an evidence that the EE project addresses the social and economic issues that schools are facing with. The researcher observed that most educators and learners are interested in this project since they benefit directly and indirectly.

"Our learners with short sightedness are treated by specialists and receive medication or glasses. Our learner's performances improve annually." (Educator AE#1)

Figure 6.3: **An example of an integrated school health project at one of the schools involved in this study** [Source: A.S. Mawela]

The above picture was taken during participatory observation as evidence of this unique and most needed EE project in Alexandra (cf. chapter 2: contextual understanding of Alexandra Township). Most learners were identified with problems of sight, and hearing. This type of project could not be related to any other country, since other country seem not have it.

Category: (vi) Baswa le Metsi (trans. Youth and water project) EE project

Water scarcity is a problem in primary and secondary schools in Alexandra Township. This is as results of pipe leakages (cf. Chapter 2). The existence of the Baswa le Metsi EE project was confirmed by facilitators (HSF#1) and (AP#3-7 and AE#3-7). The purpose of this project has been outlined as follows:

"We intend to bringing awareness amongst learners with regard to the wise usage of water." (Principals AP# 3-7)

According Mathee, Barnes & de Wet, (2000), the three main sources of water in Alexandra are indoor supplies (26%), on-site supplies (46%) and public taps (27%).

The situation of water scarcity is also affecting the entire South Africa. The seriousness of water scarce has been recognised by DWAF (2004), who stated that, given the demographic trends, South Africa as a whole is likely to have a water deficit of approximately 1.7% by 2025.

"Shortage of water in a school can become a health hazard and often disrupts the normal functioning of the school, since sometimes learners have to go home early than normal time." (Principal AP#4)

In Zimbabwe, water scarcity impacts negatively on sanitation, since learners are no longer using toilets in schools, but are forced to find alternative place of relieving themselves, such as in the bush, of which it is unhygienic places, (MDG Status Report Zimbabwe (2010). The observation indicated that learners in Alexandra Township are allowed to go home early if there is water shortage.

"The project does not get the attention it deserves since, schools only respond to the call of the water week awareness once in a year." (Facilitator HSF#1)

The observation made by the researcher indicated that in certain schools leaners fail to make use of toilets because of lack of water. Poor pressure results in dysfunctional toilets and learners overcrowd the few available toilets with water to flush and wash hands.

"Learners are aware on how to flush at the toilet and to wash their hands without wasting water." (Educators AE#7)

Due to water scarcity awareness programmes that some of the schools conduct, it seems as if learners in such schools are aware of washing their hands after using the toilet as part of promoting hygiene. In order to prevent the problem of water scarcity, educators and principals should have plans on how to harvest rain water.

Category: (vii) Safe playground and violence prevention EE project

The safe playground and violence prevention EE project predominates in the secondary schools. Principals BP#1-4 and Educators BE#1-4 confirm that learner violence is a challenge, hence the establishment of this EE project.

"We face problems of learners smoking drugs and drinking alcohol and turn to be rude and violent to learners and educators. Unfortunately parents are not anywhere to help us." (Principal BP#1&2)

"Learners bring dangerous weapons to school, such as panga and guns from home, and they end up hurting one another." (Educators BE#3&4)

"In primary schools, safe playground is a prioritised EE project, since most learners are still young and they often get hurt when playing." (Principals AP#4)

"The purpose of this EE project is to ensuring the safety of learners when they are playing during break and when they are participating in sports." (Educator AE#1-3)

"The effectiveness of the project is very much minimal since, most educators during break time hardly adhered to the break duty time table and not interested in extra and co-curricular activities." (Principals AP#1-3) and (BP#1&2)

Category: (viii) Feeding scheme EE projects

The researcher's observation confirms that nutrition is prioritised in all primary and secondary schools in Alexandra Township. Primary schools are sponsored by the South African "Tiger Brands" company that provides breakfast in class to all primary school learners; secondary schools only receive the Gauteng DoE feeding scheme. Alexandra Township primary and secondary schools are classified under quintile 1 to 3 (non-fee) paying schools, since the community is poor government introduced feeding scheme for the undernourished learners. All primary and secondary schools that are categorised as Quintile 1 – 3 (most deprived schools) take part in the NSNP (Republic of South Africa National Treasury, 2014a: 25).

To confirm the above information, participants' responses are recorded as follows:

"Our school has both Tiger Brands and GDE feeding schemes; we feed learners in the morning while sitting in classes and offer lunch late during the day." (Principals AP#1-13 & educators AE#1-13)

According to Gorki (2016), schools have been identified as a key setting for strategies to shape healthy dietary patterns, because children often consume a significant portion of their daily calories at school, and they spend more time at school than any other environment away from home. In countries such as USA national nutrition programme aim at reducing obesity, while in South Africa is aiming at reducing malnutrition problem. In South African, needy learners are served daily with a balanced meal which is composed of protein (soya products, dried beans and milk), starch (maize meal, sump rice and potatoes), fruits (apples, banana and oranges) and vegetables (spinach or cabbage), (Ndebele, 2009).

"In our school we only receive Gauteng DoE feeding scheme, and wish to have the Tiger Brands in order to have continuation of feeding same learners from primary schools." (Principals BP#1-6)

Alexandra township primary schools learners receive breakfast in class through the help of Tiger Brands Company that is working in partnership with the department of Basic education. According to Mkosi, Wenhold and Sibanda (2014), stated that the objectives of the National School Nutrition Programme is to contribute towards enhancing learning capacity through school feeding, to strengthen nutrition education in schools, and to promote sustainable food production initiatives in schools. The researcher's observation indicated that in most schools, breakfast in not being served in class, due to educators late coming and commitment towards nutrition programme.

"The project aimed at eliminating the nutritional problems facing most of the learners from disadvantaged families daily." (IDS#1)

According to Graham, Hochfeld, Stuart and Gent (2015), school nutrition programmes are widely regarded as excellent interventions to improve the health and well-being of children living in poor circumstances. They reduce short-term hunger, improve children's food security, lead to more effective short and long-term learning at school, mitigate children's vulnerability to stunting, and help manage cognitive delays associated with malnutrition.

"Late-coming educators disadvantage learners from having their breakfast in class." (Principal AP#3)

Learners are deprived of learning table manners such as eating while sited, closing your mouth when chewing food, be silent while eating, and tidying-up the table after eating due to late coming of educators. That shows lack of understanding of importance of adequate nutrition in learner's health. According to Gelli (2010); Adelman, Gilligan and Lehrer (2008), the importance of adequate nutrition from birth throughout childhood cannot be over emphasised. Many children will not fulfil their intellectual, physical, social, and, later, their employment potential if not well fed.

The principal gave permission to the researcher to take the picture of learners sitting outside the class as a result of educators' late coming. (cf. figure 6.4.) As the primary principal highlighted above, instead of learners eating breakfast in class, they are seated outside the class due to educators who arrive late; classrooms are still locked.

For the sake of confidentiality, faces of participants are covered.

05/11/2013

Figure: 6.4. An example of a feeding-scheme project at one of the schools involved in this study [source: researcher A.S. Mawela]

There is a room for improvement in the implementation of the NSNP especially when it comes to promoting sustainability of the project in schools and meaningful collaboration with other stakeholders such Tiger brands.

The next section will discuss the management of the above outlined EE projects in schools.

6.4.1.2   Theme 2: Barrier to management of EE projects in schools

All principals acknowledge the important role of EE projects in their schools. The categories that gave rise to this theme were as follows: barriers to managing EE projects, and the causes of barriers to managing EE projects in schools. These categories are discussed next.

Category: (i) Identifying barriers to managing EE projects in schools

The principals, educators, subject facilitators and IDSOs' data collected from open-ended questionnaires indicated the importance of EE projects in schools as well as

barriers to managing these projects. This category is captured by several responses from the participants illustrated as follows:

"There is lack knowledge and skills on how to manage EE projects and that is the reason we prefer to partner with non-governmental organisation for their expertise." (Educators AE#5-12 & BE#1- 2)

The researcher's opinion is that, even though the regulation emphasizes the need of EE in any school curriculum, teachers may not be able to offer applicable teaching activities due to their unfamiliarity of content knowledge and lack of teaching training related to environmental topics. It is assumed that teachers' knowledge of, and values regarding the environment and its associated problems, may influence their teaching practices and their perceptions on students' learning in EE (Ballantyne & Packer, 1996).

"We the coordinators of EE projects are not being compensated and that is discouraging us since other educators do not want to participate." (Educators AE#8 &9) and (educators BE#2-&6)

The researcher's observation indicated that, the attitude of educators towards environmental education projects is negative, that is also indicated by educators late coming to school which compromises breakfast in class. The negative attitude towards EE projects emanate as a results of lack of compensation towards EE project management. As a result educators do not find it worth spending time and putting effort on something that does not reward them financially.

"EE projects are time-consuming, since we have curriculum based subjects that we must complete at a set duration." (Educator BE#5)

The researcher's opinion is that, most of the educators seem not be aware of the integration of EE in their subjects. The statement above shows that EE is seen as additional subject that is not part of curriculum or which does not necessarily add value since it not one of the subject. Hence, educators pay more attention into the subject content that they are trained to teach and neglect the alien themes on environmental

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education which are classified as time consuming. Tilbury et al. (2005:3) state the following as barriers to managing EE projects in Australian schools: EE is simply seen as an add-on or a cross-curricula theme, teaching and learning approaches do not cater for EE projects and EE remains a non-mandatory component of schools and still struggles for acceptance in mainstream curriculum in Australia.

According to Ernst (2009), environmental education related learning and perceived outcome may determine teachers' decisions to implement EE project in schools. Environmental education teacher training should offer professional development opportunity to educators that allow to critically reflect on their own belief and knowledge regarding environmental issues and practice strategies to teach EE. In this way, educators will not view EE projects as time consuming, but another effective way of teaching certain concepts in their subjects. With proper professional development, educators will easily integrate EE in their disciplines, although this require appropriate pedagogy, (summers, 2005). The below utterances by IDSO#1 is a clear indication of the need for professional development on educators about the integration of EE in other subjects and value of EE projects in our schools.

"School principals and educators are unable to manage EE projects because they were never trained at college nor receive in-service training after being employed as professional educators."(IDS# 1)

"There is lack of commitment by the teaching staff, learners and general assistants in participating in EE projects since are viewed as an extra work without a pay." (Principals AP#12-13)

The above quotations from school principals, educators, subject facilitators and IDSOs substantiated the following conclusions. EE projects in general are not well managed in schools. Several factors contribute to this: lack of knowledge of project management; lack of managerial skills necessary to implement projects and individual problems experienced by school principals and educators respectively.

School principals and educators of primary and secondary schools agreed that they are experiencing barriers to managing EE projects in schools. School principals

indicated a lack of commitment by the teaching staff, learners and general assistants in participating in EE projects since is viewed as extra work without pay. Principals also stated that they have unskilled general assistants who are not trained in managing projects, such as vegetable gardening and as a result, they are compelled to pay an outsourced person. Moreover, principals pointed out that educators' confidence and level of expertise impact negatively on EE projects. Educators do not have the knowledge and skills required to manage EE projects. On the other hand, educators also stated that EE is integrated into curriculum subjects that are demanding. They are committed to completing the subject syllabus and this left them with no room to devote to EE projects.

Systemic management emphasises the role of leadership by principals as essential, since principals can encourage practices and behaviour of educators in order to manage EE projects well with superior quality performance (Anderson et al., 1995; Flynn et al., 1995; Saraph et al., 1989).

Primary educators identified formidable barriers to managing some projects, such as keeping learners' toilets clean. Most learners in the lower grades, such as grades R and 1, require training on proper use of the toilets. The researcher also observed that the inadequacy of the water supply in schools result in a very low standard of cleanliness in toilets and the surrounding school environment.

Category: (ii) Causes of barriers to manage EE projects in schools

Data collected from the principals, educators, subject facilitators and IDSOs identified causes of barriers to managing EE projects in schools. This is highlighted by the following statements:

"In order to manage EE projects the department should provide us with resources such as enough general assistance and allocate funds in our resource allocation specifically for EE project." (Principals AP#1-7 & BP#1-4)

The issue of resources in managing environmental education projects in schools is of serious concern. Bartosh (2003:113-114), indicated that educators in America

indicated lack of funding and resources materials as barriers to managing EE projects in schools. According to King (2015:17) lack of funds, resource materials are identified as barriers to managing EE projects in South African schools.

"In most schools, there is no policy that acts as guideline in managing EE projects. School principals do not show that they have project management knowledge." (IDS#2&5)

"Schools do not have systems in place that are in line with project management." (SF#1&3)

"In some schools principals are unable to budget for EE projects and to even to plan the Project." (SF#2)

"No assigned officials from the DoE to address EE projects with principals and educators." (IDS# 3)

Caldwell (1992:16-17) states that managers of the schools must be able to develop and implement systems involving seven managerial functions, namely: goal setting needs identification, priority-setting, planning, budgeting, implementing and evaluating. Principals need knowledge and skills on how to compile a budget that will cater for EE projects even though the DoE does not allocate funds in the resource allocations.

Primary and secondary school principals highlighted the seriousness of lack of space around their schools. That is why vegetable gardens are established in empty tires (cf. figure 6.1.)

The SABS ISO 9004-2 (1991:16) acts as guideline to insure that all services, requirements and provisions incorporated in the quality system should be defined and documented as part of the service organisation's overall agent. For effective total quality management of EE projects, school principals should define the type of resources required and document them for future reference.

"Hawkers who sell near school gates are not responsible for the litter, such as banana peels that are thrown all over the school premises and its surroundings." (Educators AE# and BE#4)

Moreover, both in primary and secondary schools, principals and educators stated that hawkers selling their wares near schools formed part of the barrier to managing litter in schools since hawkers do not clear up their litter. The IDSOs and subject facilitators also commented on the negligence of the hawkers who are selling bananas and sweets near school gates, which causes littering in and outside the schoolyard. The involvement of different stakeholders, such as parents who are selling at the gates of the schools, is necessary to minimize littering. IDSOs pointed out that schools do not have policies to act as guidelines in managing EE projects. In addition, they also indicated that education authorities did not have officials assigned to deal with EE issues, with the exception of one officer to look after school hygiene, but not other EE projects.

Total quality management theory calls for the use of systematically collected data at every point in a problem-solving cycle - from determining high-priority problems, through analysing their causes, to selecting and testing solutions (Juran, 1974: 22.1-28.1; Ishikawa, 1985: 104-105; Deming, 1986: chap. 8). From the open-ended questionnaires and the participant observation it is evident that school principals and educators have gathered data relevant to the causes of barriers to managing EE projects in schools at every point when they are managing EE projects. However, they are unable to analyse these causes in order to find solutions that can be used in future.

6.4.1.3 Theme 3: Possible strategies for better management of EE projects in schools

All principals, educators, subject facilitators and IDSOs acknowledge that the available EE projects were not being well managed. The role of school managers and stakeholders, together with the position of educators in managing EE projects in schools, are categories that constituted this theme. These categories are discussed in the subsequent headings.

Category (i) role of school management and stakeholders

School principals expressed the way in which hawkers add to problems and frustrate the management of clean up/sanitation EE project.

"School management team should pass regulation that will force the hawkers to sell to commit themselves to cleaning the schoolyard as part of taking responsibility towards cleanliness of the school." (Educators AE# and BE#4 and SF#1-4)

The idea of EE introduced as a subject in the curriculum so that it can receive the same attention as other curriculum subjects was mentioned by school principals, educators, subjected facilitators and IDSOs.

"EE projects are time consuming, since we have curriculum based subjects that we must complete at a set duration." (Educator BE#5)

In addition, principals suggested that the DoE should provide schools with policies on EE and waste management. IDSOs recommended that school principals and educators should be trained on EE project management.

The systemic management theory should further provide opportunities for school principals to organise a set of relationships between schools and stakeholders that may provide the necessary expertise and knowledge of how to manage EE projects (Mason, 2007: 10). This supports the comments made by subject facilitators who suggested the establishment of a working relationship between the schools and the non-governmental organisations as a way of enhancing the school principals' knowledge and skills in EE project management in schools. School management should make the DoE aware by means of writing a memorandum that requires them to provide resources, such as human resource and capital, for EE projects and to suggest remuneration for committed EE projects educators.

Category (ii) Position of educators in EE projects

Several complaints were raised by educators regarding the management of EE projects including the lack of participation by principals, lack of interest from other educators and lack of resources.

Educators from both primary and secondary schools further viewed the participation of parents in EE projects as crucial since most educators do not have the time to manage EE projects.

"We are not being consulted with regard to policy making and how EE themes should be integrated into the curriculum subjects." (Educators AP#1-10 and BE#1-5)

Educators felt undermined by the DoE, since they are not consulted on issues regarding curriculum development and implementation. They therefore suggested that they should be consulted on issues pertaining environmental education.

"We are unable to manage EE projects just because we are not receiving any kind of training or workshop". (Educators AE#11-10 and BE#1-5)

Educators found it important that workshops should be conducted once a term for them to gain knowledge and skills on how to manage EE projects. Community awareness programmes on environmental problems in and around schools should be looked at as an important part of the solutions on barriers to managing EE projects. As indicated by Deming (1986:67) senior leadership 'principals' are critical for organisational success, and the quality of management they offer is an effective means to manage quality in the context of systems developed (Fox & Flakes 1997). The next theme will discuss the assistance offered by subject facilitators and IDSOs to school principals and educators

6.4.1.4 Theme 4: Assistance offered by district officials to managing EE Projects in schools

From the data collected from subject facilitators and IDSOs the following themes emerged: the role of subject facilitators and the role of IDSO's in assisting principals and educators to manage EE projects in schools. The themes will be discussed as follows:

Category (i) role of subject facilitators in EE projects

"As much as we are not directly involved in the management of EE projects in school, but we are expected to give guidelines on how to integrate EE themes in the current curriculum subjects. "(SF#1-4)

Subject's facilitators indicated that their role was to assist educators in specific subjects as per their specialisation with regard to teaching and learning.

"I am not involved in teaching in learning, but to monitor the schools health and safety environment, and not necessarily entitled to deal with EE projects, although I may contribute if there be a need." (HSF#1)

Only one person in the entire district was allocated the task of being a health and safety facilitator and focused only on school cleanliness.

Subject facilitators' role, during transversal visits, is to give feedback to educators. "Those who are teaching tourism, I encourage them to integrate EE projects into tourism." (SF#1)

Subject facilitators also indicated that although policy formulation is not their responsibility, given the opportunity to assist school principals and educators, they would do so.

Category (ii) Role of IDSOs

"We also do not have the necessary knowledge and a skill on how to manage EE projects since it is not our area of specialisation." (ID#1-5)

IDSO's indicated that they find it difficult to assist principals since they lack the necessary knowledge on how to manage EE projects.

"We only advise principals on how to formulate policies on health and safety and monitor school cleanliness once in a term and our roles and responsibilities do not include the management EE projects in schools." (ID#1-5).

Brennan and Shah (2000:12) indicate that total quality management refers to the systems which are developed to monitor all processes that are part of the work of an organisation. Comments made by subject facilitators and IDSOs indicate that the DoE does not have any system in place to monitor schools principals and educators on how to manage EE projects in schools. The DoE does not have stipulated job descriptions that relate to the monitoring of EE projects in schools. Both subject facilitators and IDSOs lack dedicated knowledge on how to train or assist schools principals and educators in the management of EE projects.

6.5   CONCLUSION

The purpose of this chapter was to present the findings of the empirical research pertaining to barriers to managing EE projects in Alexandra Township primary and secondary schools. Themes and categories that emerged under the questionnaires and participatory observation were outlined as follows: the first analysis comprised the identification of EE projects in schools, followed a discussion of the management of projects in schools, possible solutions to managing EE projects in schools and the assistance offered by district officials to managing EE projects in schools.

The next chapter will discuss the summary, conclusions and recommendations of the study.

CHAPTER 7
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

7.1   INTRODUCTION

The previous chapter focused on the discussion of findings of the empirical study and the literature analysis; the categories and main themes that emerged from the research data were outlined. This chapter provides the summary and conclusions as well as the recommendations. Its purpose is to determine whether the research aims of the study were achieved. To address the research question, the researcher conducted a literature study and the empirical research. The total quality management and systemic management theories were used as the theoretical framework to endorse the management of EE projects in schools.

The first part of this chapter focuses on presenting a summary of the literature review and the empirical study. This is followed by a synthesis of the research findings and a discussion of the conclusions of the study as they relate to the research questions. The recommendations of the study are explained and the chapter ends with the review of the limitations of the study, conclusions and suggestions for further research.

The next section discusses the summary of findings.

7.2   SUMMARY OF RESEARCH FINDINGS

The findings of the study reveal principals, educators, subject facilitators and IDSOs' recognition of the importance of the management of EE projects in primary and secondary schools. The findings also highlight the barriers to managing EE projects in schools, the standard of managing EE projects used by school principals and educators, and the level of assistance offered by subject facilitators, health and safety facilitator and the IDSO's. The findings are consistent with the theoretical framework as indicated in chapter 4 and are supported by the literature review in chapter 3 which aid in answering the research questions in chapter 1. The findings of the literature review, the empirical investigation and participatory observation are referred to in subsequent sections.

7.2.1   Summary of the literature review

The literature review began by discussing the theoretical framework employed in this study. The theoretical perspective of this study is the total quality management theory and the systemic management theory discussed in chapter 3. Both theories indicate the value and necessity for school principals, educators, subject facilitators and ISDOs in putting systems in place when managing EE projects.

The total quality management theory emphasises that total quality management in EE projects management refers to the systems that are of quality. They ensure a prevention-based approach, in this study referred to as 'barriers to manage EE projects in schools' and relate to reliable products and services activities which are dependable and consistent. It provides quality assurance and confidence to school principals and educators that future planned EE projects will produce the desired end result. Total quality management is a means of ensuring that errors are, as far as possible, avoided (cf. section 4.3). It is developed to monitor all processes that are part of the EE project at a school. According to Brennan and Shah (2000:12), this implies that school principals and educators should employ the total quality management theory when managing EE projects. (cf. section 4.3).

With reference to section 4.4, the insight gained from the systemic management theory is that this theory presents a specialized process of pattern-based decision-making that avoids inconsistency, subjectivity and error in managing EE projects in schools (Fowler, 2009:3). With reference to the findings on management of EE projects in schools (chapter 6, section 6.4.1.2), it is evident that school principals were unable to plan, budget, implement, evaluate and monitor the EE projects. Caldwell (1992:16-17) indicates that managers of the schools must be able to develop and implement systems involving seven managerial functions, namely: goal setting needs identification, priority-setting, planning, budgeting, implementing, and evaluating. It is the objective of systemic management to see to it that school principals as managers are able to set goals, plan, budget, implement and evaluate EE projects.

The literature study covered in chapter 3 assisted in contextualising the nature of the research problem. The literature outlined the significance of EE in schools globally and

locally. In this regard Cock and Fig (2002:114) state that the South African National Parks through its directorate of social ecology should focus its EE projects on local schools and youth clubs with the aim of providing an extension from the classroom to the out-of-doors which is rich in potential and provides a multi-sensory, hands-on experience. The literature review further gave an overview of EE projects in schools in Australia, Canada, USA, Namibia, Zimbabwe and South Africa. It focused on ways schools are managing them, barriers in managing EE projects and possible solutions. This was conducted in order to find out how successful schools have managed EE projects (cf. chapter 3, section 3. 4)

The education policy in South Africa describes EE as a "vital element" for all educational levels and programmes with the purpose of creating "environmentally literate and active citizens" (DoE 1995:18). From countries that were involved in this study, the following emerged as commonly identified EE projects in their schools, namely: Food gardening EE project; Nutrition food EE project; School greening EE project; Water-wise EE project; Waste collect EE project; Identifying sources of water pollution in a stream EE project; Overharvesting of medical plants EE project; Ecological school yard landscaping EE project; Renewal energy EE project; and Wildlife extinction EE project. While it is commendable that schools, both globally and locally, have EE projects, their management is still a serious concern considering the outlined number of barriers which still need to be addressed.

With reference to the literature review (chapter 3) It emerged from this study that the unsuccessful management of EE projects in Australian schools is as a result of educators being reluctant to engage in such projects, lack of knowledge and skills, lack of resources and inadequate time to teach, establish and manage EE projects in schools (Gough 2004:31). These findings call for educator training on EE projects for them to acquire knowledge and skills on how to manage and allocate necessary required resources in this regard.

In addition, Laina (2004:2) states that, in the USA EE is hardly seen as a priority and the majority of the EE projects that do exist are provided by outside experts. Moreover, educators in the USA feel overwhelmed by adding EE projects; principals indicate that they have no budget, no personnel to organise the EE projects, no planning of EE

projects in schools nor compensation for educators managing EE projects (Chapman 2014:4). It is evident from this study that the role of EE projects in schools should be emphasised in order to change the perception of EE projects among educators. The school principals are not putting systems in place (planning) to ensure that funds are available to compensate the personnel required, thus, a lack of total quality management. (cf. section 6.4.1.2).

The reviewed literature further elucidated findings in Canada and Namibia that illustrate the barriers to managing EE projects in schools. The lack of a budget to manage EE projects in schools and the lack of theory or methods to manage EE projects were raised as concerns by Rosset (2006:8). In Namibia, Imene (2010:6) highlights resistance from educators, lack of confidence and experience, and lack of support from school management results in unsuccessful management of EE projects in schools. Haindongo (2013:192) also indicated that EE projects are not successfully being managed in schools as a result of principals who do not support them, schools do not have experts in managing EE projects and lastly, educators feel felt out since they do not form part of EE policy making.

The school principals do not seem to be encouraging the management of EE projects. Principals do not budget for the EE projects nor motivate reluctant educators by compensating them. Principals are also not outsourcing experts to assist educators in managing EE projects. This is a clear indication that principals are lacking total quality management and systemic management approaches to EE projects in schools. (cf. section 6.4.1.2).

Next is the summary of findings from the empirical study.

7.2.2   Summary of findings from the empirical study

Several themes related to the research questions emerged from the open-ended questionnaires and conducted observation on barriers to managing EE projects in Alexandra township primary and secondary schools. The following themes emerged from the empirical study: EE projects in schools (cf. chapter 6, section 6.4.1.1.);

management of EE projects in schools (cf. chapter 6 section 6.4.1..2.); possible solutions to managing EE projects in schools (cf. chapter 6, section 6.4.1.3); assistance offered by district officials to managing EE projects in schools (cf. chapter 6, section 6.4.1.4.)

It is evident from the empirical findings that schools in Alexandra Township have EE projects. The findings revealed that schools have vegetable gardens as EE projects which are mainly focusing on supplementing food from the DoE to feed learners. In certain schools, the water-wise EE projects were established with the aim of bringing awareness on the use of water since most schools experience a shortage of water for toilets and drinking purposes.

In addition, all schools in Alexandra Township had to comply with the requirements of the 'Clean up/Sanitation campaign EE project' which was a compulsory EE project, the initiative of the MEC of Education, Mr Lesufi, to make sure that all schools' toilets, classrooms and surrounding grounds remain neat and tidy at all times.

The feeding scheme EE project (primary schools sponsored by Tiger Brand and the DoE; secondary schools only receiving food from DoE) was established by all schools in Alexandra Township. Moreover, the *Bontle ke Botho* EE project also known as greening schools EE project dominated most schools, although some had a lack of adequate space to plant trees.

Another EE project found in Alexandra Township schools is the recycling EE project, which was also known as waste management EE project in certain schools, aiming at combating littering within and surrounding school premises; in other schools it was aiming at generating funds as part of fundraising. The most unique EE project in all schools in Alexandra Township was the integrated health EE project, which focused mainly on the health of learners, parents and staff. Learners and parents receive special health treatment for eye, ear and dental care, HIV and Aids, blood pressure, and diabetes.

It is evident that school management and principals shy away from the responsibility of managing EE projects in schools. This answers the secondary aim of the study in

chapter 1 (section1. 6): 'Who are the role players in the management of school EE projects in Alexandra Township?'

In each EE project, school principals should make sure that the scope of the project has been laid down properly, followed by a time frame, planning and control, available human resources to carry out the tasks, the means of communication to be used as well as the risks in undertaking such a project (Bisschoff, 2005:28-29). Due to lack of project management knowledge, primary school and secondary school principals are experiencing the following barriers to managing EE projects in schools (cf. chapter 6, Sections 6.4.1.2): a lack of commitment from the teaching staff, learners and general assistants in participating in EE projects. In addition it has been alluded that staff views EE projects as extra work without pay. The management of the school and the principal's commitment is aimed at completing the subject syllabus; hence the educators are also committed to completing the subject syllabus with no room to devote time to EE projects. Furthermore, the main role players in managing EE projects are principals; however, they are unable to plan, make use of available human resources and to communicate effectively to educators on the importance of EE projects in schools. Consequently, principals regard educators as people who do not have the confidence and expertise to managing EE projects.

In trying to find possible solutions to successfully managing EE projects in schools, the extent to which principals, educators, subject facilitators and ISDOs are aware of systemic and total quality management theories was looked at. Total quality management theory calls for the use of systematically collected data at every point in a problem-solving cycle - from determining high-priority problems, through analysing their causes, to selecting and testing solutions (Juran, 1974: 22.1-28.1; Ishikawa, 1985: 104-105; Deming, 1986: chap. 8). In working out a better system to assist in the management of EE projects in schools, the DoE should provide schools with policies on EE and waste management. Furthermore, as suggested by IDSO's, school principals and educators should be trained on EE project management. While raising their concerns, educators indicated that the feel left out and undermined by the DoE since they are not consulted on issues regarding curriculum development and its implementation. They therefore suggest that they should be consulted on issues pertaining to EE integration of themes in curriculum subjects.

The empirical study also investigated ways in which the subject facilitators and the IDSOs can assist the school principals and educators on how Alexandra Township schools can improve management EE projects. The findings indicated that subject facilitators cannot help schools with the formulation of school EE policies since they focus on their subject of specialisation when visiting schools. The ISDOs highlighted that they also lack knowledge on how to manage EE projects.

7.2.3   Findings from the participatory observation

The researcher's observations, which were carried out during participatory observation, yielded similar outcomes in comparison with the empirical study on how EE projects were managed in primary and secondary schools in Alexandra Township schools.

The level of managing EE projects in Alexandra Township primary and secondary schools were poor, even though schools do have EE projects. School principals and educators were not actively involved in the management of EE projects. However, in the few schools where educators are participating, they were also reluctant to offer their best, since they were not paid. In most primary schools where the Tiger Brand breakfast feeding Scheme project was involved, educators failed to comply with the regulation: learners must eat breakfast while in class. This is due to lack of commitment as educators regularly arrive late to school and this results in learners eating while sitting outside the class (cf. figure 6.1). School principals also showed a lack of total quality management since they did not enforce rules regarding educators late coming.

The researcher's observed that certain educators were reluctant in managing EE projects in schools. In certain schools, school principals are seen by educators as managers who are not interested in the management of EE projects since they do not make an effort to outsource experts to assist educators with knowledge and skills on how to manage EE projects. There was no leadership role displayed in ensuring that EE projects are well managed.

Another finding exposed that schools were under resourced with personnel to assist in managing EE projects, such as the Clean-up/Sanitation campaign EE project. The number of toilets, classes, corridors, offices and the surrounding yard to be cleaned on daily basis required more personnel. Due to too few personnel, such EE projects could not be managed well. In most schools, the recycling project was poorly managed since schools did not have dustbins. The observation findings also paid attention to the principals' method of managing EE projects: planning, organising, commanding and coordinating as indicated by Henri Fayol (May 16, 2011.) and found that school principals as indicated by some educators could not plan and organise the EE project to an extent that it yielded successful results.

Next is the synthesis of the research findings.

7.3   SYNTHESIS OF THE RESEARCH FINDINGS

In accordance with the requirement of systemic management, school principals should employ a specialized process of pattern-based decision-making that avoids inconsistency, subjectivity and error in managing EE projects in schools, (Fowler, 2009:3). The pattern-based decision-making involves proper planning and organising of the EE projects before the execution stage. In order to avoid inconsistency and making errors the stage of risk management of EE projects should be addressed. Putting systems in place will reduce inconsistency and encourage the school principal to conduct a needs analysis, which will also cover the lack of knowledge and skills of educators and the requirement for training and workshops prior to the execution of EE projects. This is in line with the empirical findings in which participants repeatedly requested training and follow-up workshops in order to gain knowledge and skills on how to manage EE projects.

Principals should encourage practices and behaviour that lead to superior quality performance of staff in managing the EE projects in school. (Anderson et al., 1995; Flynn et al., 1995; Sara et al., 1989). The empirical findings show that educators are integrating EE themes in their curriculum subjects, but they are not involved in policy decision making and how themes should be included in such subjects. Educators also highlighted that they see EE projects as time consuming. They are reluctant to

manage EE projects since they lack relevant knowledge and skills. Martins and Martins (2008:380) state that the school managers should create a culture that sets high levels of commitment and performance. School principals should involve educators in developing a school-based EE policy and develop a holistic approach of integrating themes from various subjects in order to establish different EE projects.

The empirical findings indicate that although is evident that EE projects exist in primary and secondary schools, educators are reluctant in teaching EE. In Zimbabwe, EE projects are carefully integrated into other subjects and when conducting assessment a certain percentage is assigned to EE themes which makes educators comply in managing EE projects. This shows the level of planning and implementation employed by the DoE of Zimbabwe, which supports total quality management and systems which yield results.

Caldwell (1992:16-17) states that managers of schools must be able to develop and implement systems involving managerial functions such as goal setting, priority-setting, planning, budgeting, implementing and evaluation. In contrast, the empirical findings indicate that the implementation of total quality management and systemic management theory is still impractical in primary and secondary schools in Alexandra Township.

The reviewed literature, the empirical findings, including the participatory observation identified similar factors that hamper the management of EE projects globally and locally. Lack or resources (money) and time, lack of knowledge and knowledge gap, lack of skills among educators, lack of commitment from educators and school principals, educators' reluctance to teach and manage EE projects, educators' lack of confidence and expertise, overcrowded curriculum, lack of workshops and training on EE projects, school principals' lack of knowledge on project management, lack of community involvement and lack of leadership from school principals are factors mentioned in literature as barriers to managing EE projects in schools (Mukoni, 2013:12; Rickinson, 2004:14; Symons, 2008: 5; Gebreab & Bak, 2000:10; Gough, 2004:31).

The reviewed literature shows that in countries such as Zimbabwe, Australia, Namibia and USA the curriculum policy implementation processes included integration of EE in all learning institutions at various levels. Irrespective of the integration of EE into the curriculum, environmental issues and values do not take centre stage in the life of the schools and educators are still not able to fully recognize their pedagogical role and value in managing EE projects (Mukoni, 2013: 3- 4). In Australia, (Tilbury, Coleman & Garlick, 2005:3-5) suggest that the whole-school approaches, which involve staff, students and community in learning for change towards EE project management is crucial since it engages every person at school. In contrast, it emerged in the empirical findings that EE projects are school based and do not involve parents; in certain instances, not every educator in a school is involved in an EE project since they see it as an extra work without remuneration.

The empirical findings indicate that in South Africa EE is not a stand-alone subject, but integrated into other curriculum subjects. In contrast, Australia has established two EE subjects at the senior secondary level: Environmental Science (a science subject, Board of Studies, 2000a; VCAA, 2004) and Outdoor and Environmental Studies (a health and physical education subject, (Board of Studies, 2000b; VCAA, 2005a). Gough (2011: 17).

7.4   CONCLUSION

The aim of this study was to determine barriers to managing EE projects in Alexandra Township primary and secondary schools. (cf. section 1.5). The empirical study revealed several problems in barriers to managing EE projects in schools. The conclusions of this study will be outlined in terms of answers to the research questions.

Sub-research question 1: What are the EE projects implemented by primary and secondary schools in Alexandra Townships?

This question was answered by both referring to the literature review and the empirical study. It emerged from both literature and the empirical study that schools do have EE projects although they differ according to the school location and the environmental problems that need to be addressed by the school (cf. section 7.2.3).

Sub-research question 2: Who are the key stakeholders in the management of school EE projects in Alexandra Township?

The empirical research identified that the school principals are the main role players in the management of EE projects in schools. Principals are responsible for the provisioning of resources required in managing the EE projects, while educators as teachers of the curriculum subjects are the coordinators of the EE projects. The literature review indicated that educators are not motivated to coordinate the EE projects since they were not compensated.

Sub-research question 3. What roles and competencies do stakeholders have regarding management of EE projects in schools?

The literature review indicated that total quality management is a means of ensuring that errors are, as far as possible, eliminated. It is developed to monitor all processes that are part of the EE project for the school (Brennan & Shah, 2000:12). School principals' approach to managing EE projects requires proper planning, organisation, monitoring and effective communication. Schools in Alexandra Township do not use a systems approach to bring about the balance between teaching other curriculum subjects and the integration of EE projects. No systems are in place to deal with the negativity that emanates from barriers to managing EE projects in schools. (cf. section 3.4).

Sub-research question 4. How can the management of school EE projects in Alexandra Township be improved?

Interestingly the empirical studies indicate that, subject facilitators seem to be distancing themselves from managing the EE projects in schools since it is not according to their job description. ISDOs suggest that EE should become a curriculum subject for it to receive similar attention as other subjects. It has been suggested that both school principals and educators should undergo training on EE project management in order to improve the planning, organising, coordinating, monitoring and evaluating of the whole process. Proper supervision is required from the school

principal and coordinators should provide feedback on barriers encountered during the previous EE projects for future referencing. It has been highlighted that, schools should collaborate with non-governmental organisations in order to learn from the experts on how to manage EE projects. The IDSOs suggested that the DoE should provide schools with guiding policies on EE project management.

The next section comprises of the suggested recommendations that could lead to the effective management of EE projects in primary and secondary schools.

7.5   RECOMMENDATIONS

This study discovered that most schools had serious problems in managing EE projects. There is an urgent need for interventions so that improvement can take place.

The recommendations of the study focused on four aspects:

- Recommendations for including EE in the curriculum
- Recommendations for the role of school principals and educators
- Recommendations for the role of district officials
- Recommendations for the development of school principals, educators and district officials.

These aspects will be briefly discussed next.

7.5.1   Recommendations for including EE in the curriculum

The present Curriculum Assessment Policy Statement does not have EE as a subject on its own, but it is integrated in other subjects. EE is introduced as themes within other subject contents. The chances of such themes to be taught are minimal, bearing in mind the syllabus that the educator has to cover in preparation for the end of year examination. It is recommended that EE should be included as a subject in the curriculum.

For schools in Alexandra Township to start improving their way of managing EE projects, they should acknowledge that environmental action through clubs, school participation in the national EE policy formulation processes, school participation in environmental expo's and commemoration of environmental days are crucial in developing an environmental ethic. Through active participation in EE projects, school principals and educators can learn more about managing EE projects (Herbeden, 2001:23). IDSOs further stated that EE must be a compulsory subject in schools. EE projects should be established in schools in collaboration with non-governmental organisations that can provide outside experts.

7.5.2   Recommendations for the role of school principals and educators

The current situation on managing EE projects in schools is unacceptable. School principals should take the role of leaders and managers of the schools. School principals together with educators and the school governing body members should develop policy on EE projects in schools. They should find sponsorships that will sponsor the EE projects, the educators and the staff working on the EE projects.

In the meantime, while waiting for the inclusion of EE as a stand-alone subject in the curriculum, the educators should teach the themes integrated in their subjects and initiate EE projects. Lack of time dedicated to EE projects was identified as one of the major barriers. It is recommended that school principals introduce EE projects days, one day in a week, and schedule time for discussion among educators and principals on how to initiate and manage EE projects.

Furthermore, principals should approach the non-governmental organisations that are working on EE projects in schools, such as WESA to partner with them in order to gain experience on how to manage EE projects. It is essential that school principals should have knowledge and understanding of project management functions and know how to combat barriers to managing EE projects.

7.5.3   Recommendation for the role of district officials

The Johannesburg east district subject facilitators and ISDOs should work together in order to help principals and educators with new ideas on how to manage EE projects in schools. Their active participation in managing EE projects will build the principals and educators to build confidence.

Lack of school-based EE project facilitators, policies on EE and planning resulted in barriers to managing EE projects in schools. The recommendation in this regard is to develop an understanding of policy and informative plans that lay out the school's aims and objectives for integrating EE in other curriculum subjects and reasons for the EE projects. The DoE should not exclude educators, but involve them in developing such policies and plans, so that they can have ownership of implementation.

The DoE should underpin the responsibility of monitoring and supervising the implementation and management of EE projects in job descriptions of the subject facilitators and the IDSOs. Subject facilitators and IDSO's should conduct meetings of nearby schools to share good practice and challenges with regard to the management of EE projects. When setting exams, subject facilitators should require certain percentage of marks to be allocated for activities that learners participated under the EE project. This will give value and reasons to educators on why they should manage EE projects.

The IDSOs should regularly monitor and evaluate the management of EE projects in schools. They should be in the position to develop systems that will help school principals to manage EE projects. The DoE should create EE project websites for schools to share information on how to manage EE projects. IDSOs must advise the DoE to build schools where there will be adequate space to enable them to practise EE projects. It should be the role of IDSOS to link environmental organisations with schools, so that they can offer assistance to schools on how to manage EE projects.

7.5.4 Recommendations for the development of school principals, educators and district officials

School principals, educators, subject facilitators and ISDOs' development can be seen as a process including awareness of an imperfect job related to their work or situation, formulation of a remedial action strategy and effecting remedial action (Evans, 2002:134). The term development is used to mean all types of professional learning undertaken by school principals, educators, subject facilitators and IDSO's beyond the point of initial training, the concomitant skills learnt and developed in these learning processes, and changes in approaches to practise resulting from them.

Based on the empirical findings and literature analysis that indicated that school principals and educators lacked knowledge on how to manage EE projects, it is imperative for the Gauteng DoE to conduct intensive EE project management training workshops and institute continual training to ensure that school principals, educators, subject facilitators and IDSO's are able to manage EE projects in schools.

School principals should start by employing total quality management and systemic management approaches. They should receive training on how to put systems into place that will avoid inconsistency and errors in managing EE projects. This is supported by Fowler (2009:34) who indicated that systemic management is presented as a specialized process of pattern-based decision-making that avoids the inconsistency, subjectivity and error in current management, while total quality management provides a historically unique approach to improving organizational effectiveness, one that has a solid conceptual foundation and, at the same time, offers a strategy for improving performance that takes account of how people and organizations actually operate (Wrack & Jensen, 1994).

Educators should start by acquiring knowledge on how to integrate EE in curriculum subjects. The methods or strategies of integrating EE projects in their subjects should be imparted to educators since they did not receive this during their teacher training. Educators should also be empowered with the EE content knowledge as per the themes integrated into curriculum subjects. The intention is to capacitate educators with knowledge and skills on how to initiate and manage EE projects in schools.

Educators need to keep themselves up to date with developments in their discipline and keep abreast of a range of new curricular and policy imperatives in the country (Robinson & McMillan, 2006:327)

Professional development is a goal-orientated and continuous process supported through mentoring, coaching and feedback and contextualised to address the perceived needs of educators within the schools (Little & Houston, 2003:76). The development of subject facilitators and ISDOs should enhance both the integration of EE and the management of E projects in schools. Their focus of development should be on how offer support to school principals and educators through monitoring, coaching, evaluating, giving feedback and contextualising in order to address the integration of EE into curriculum subjects and the management EE projects in schools.

A model is recommended to assist schools on how to manage environmental education projects using Total Quality management theory. Total quality management theory calls for the use of systematically collected data at every point in a problem-solving cycle - from determining high-priority problems, through analysing their causes, to selecting and testing solutions, (Juran, 1974: 22.1-28.1; Ishikawa, 1985:104-105;Deming,1986).

7.6   SUGGESTIONS FOR FURTHER RESEARCH

This study exclusively focused on school principals, educators, subject facilitators and ISDOs' perspectives on barriers to managing EE projects in schools. Thus, there is a need for more case studies which will pay attention to learners and non-governmental organisations in terms of their involvement in managing EE projects in schools.

Further research could focus on the feasibility of EE as a stand-alone subject in the school curriculum. Moreover, further research should investigate if EE qualified educators can have a positive influence in the initiating and management of EE projects in schools. Other areas of study could look on the EE policy development and implementation for effective EE project management in schools. And lastly, another area for further investigation could focus on the availability of published articles on EE project management for schools.

7.7 LIMITATIONS OF THE RESEARCH STUDY

Limitations are potential weaknesses in the study and are out of researchers' control (Simon, 2011:2). This study followed a qualitative research approach which has its own weaknesses which are bound to influence the study. Qualitative research is frequently criticised for lacking scientific rigour with poor justification of the methods adopted, lack of transparency in the analytical procedures and the findings being merely a collection of personal opinions subject to researcher bias (Noble & Smith, 2015:2).

7.7.1 Researcher's subjectivity

This study was conducted in the Johannesburg east district with over 200 schools, and only 19 schools from Alexandra Township Primary and secondary schools participated. The researcher's discretion was used when selecting the research participants and those selected had the necessary experience and information required to answer the research questions (cf. section 5.4.4). One educator per school was sample and this did not necessarily represent the views of the entire school.

7.7.2 The sampled size

The sampled size for the study was adequate enough to produce substantive evidence regarding barriers to managing EE projects in Alexandra Township. Based on the number of schools in Johannesburg east which is (over 200), 13 primary and 6 secondary schools including one school principal and one educator per school is relatively a small sample. This is particularly pertinent when considering the barriers that school principals and educators are encountering when managing EE projects.

7.7.3 Time allocated for data collection

School principals, educators, subject facilitators and IDSO's were given two months to complete the questionnaires; this was done with due consideration of their daily duties. Although such an ample time frame was provided, some questions were not fully answered and lacked information.

However, despite these limitations, the researcher is of the opinion that this study contributes to change perceptions of school principals, educators, subject facilitators, ISDOs and any other person who is passionate about the management of EE projects in schools. The suggested recommendations for including EE in the curriculum; the role of school principals and educators; the role of district officials; and the development of school principals, educators and district officials could certainly contribute to a turnaround strategy on the management of EE projects in schools.

7.8 CONCLUSION

All school principals, educators, subject facilitators and ISDOs are obliged to manage EE projects in schools. The nature of EE projects demands educators to integrate EE themes into curriculum subjects. The total quality management theory and the systems management theory provide opportunity for school principals to manage EE projects successfully.

The reviewed literature indicates the management of EE projects in primary and secondary schools is a priority and identified barriers to managing EE projects in schools. The empirical findings of the study concur with the literature reviewed with regard to the existing EE projects in schools, management of EE projects, the barriers to managing EE projects and the causes of these barriers to managing EE projects. (cf. section 6.2)

In conclusion, the findings from the study highlighted reasons that underlie the ineffective management of EE projects in Alexandra Township primary and secondary schools through poor management and lack of integration of EE by educators in their subjects. Further, lack of training of school principals in managing EE projects and the lack of knowledge and skill to integrate EE themes in curriculum subjects is another concern.

Therefore, this study suggests a training programme that may meet school principals' specific needs on managing EE projects and help educators to develop skills and knowledge to integrate EE projects in their subjects. Principals' training may involve the implementation of total quality management and the systemic management

theories in order to improve planning and organisation. In addition, the role of principals' leadership in order to suggest ways that principals can adopt and follow when managing EE projects could be of assistance. The provisioning of EE project policy by the DoE could help school principals and educators. Monitoring and evaluating EE projects in schools by subject facilitators and ISDOs could add value in re-enforcing the proper management of EE projects in schools.

This chapter gave a full summary of research study findings, conclusions and recommendations to address barriers to managing EE projects in Alexandra Township primary and secondary schools. The chapter discussed the contributions of the study and the recommendations that should be implemented in order to manage EE projects in Alexandra Township primary and secondary schools. Finally, the chapter gave suggestions for further research and the limitations of the study with regard to research subjectivity, sampled size and time allocated for data collection.

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LETTER OF REQUEST TO CONDUCT RESEARCH TO THE GAUTENG DEPARTMENT OF DEPARTMENT

THE OFFICE OF DIRECTOR: KNOWLEDGE MANAGEMENT AND RESEARCH
9TH FLOOR, 111 COMMISSIONER STREET
JOHANNESBURG
2001
Attention: Dr. David Makhado
Re: Request for permission to conduct research in primary and
**   Secondary schools in Alexandra Township schools.**

I am 'Ailwei Solomon Mawela' a D.Ed. student at the University of South Africa, under School of education. I am currently undertaking a research for my studies in the field of didactics in environmental education. The purpose of this letter is to seek permission to access identified Alexandra Township primary and secondary schools; and Johannesburg East district subject facilitators and IDSOs. As part of my research work, I would like to conduct a research on environmental education environmental education under a title "Barriers to managing environmental education projects in Alexandra Township primary and secondary schools".

The envisaged participants in this study are school principals; educators in environmental committees; Johannesburg East District subject facilitators; and Johannesburg East District institutional developmental support officers.

The interview will last for at the most 30 minutes. The interview will be in a form of questionnaire to be completed by participants. Confidentiality will be ensured by keeping the participants anonymous to the fullest possible extent. Pseudonyms will be used in place of real names of participants. Faces of people on the photographs taken during participatory observation by research will be shaded in order to keep anonymity of participants. The raw data will be analysed by the researcher and supervisor. Data is not meant for public consumption and will be destroyed a few years after completion of the research report.

Participants' participation in this study is voluntary. Therefore, if a respondent decides to withdraw his/her participation, he/she will not be prejudiced in anyway. Participants will not be paid for participating in this study. The benefits of the study will be for the academic purpose of learning, understanding and gaining further insights into the field of study in question.

Yours in education

Mr. A.S. Mawela

UNISA Student

APPENDIX 2

RESPONSE FROM THE GAUTENG DOE

GAUTENG PROVINCE
Department: Education
REPUBLIC OF SOUTH AFRICA

GDE RESEARCH APPROVAL LETTER

Date:	04 August 2014
Validity of Research Approval:	04 August 2014 to 03 October 2014
Name of Researcher:	Mawela A.S
Address of Researcher:	5436 Delaware Street
	Cosmo City
	Ext 5
	Randburg
Telephone Number:	071 749 1400 and 011 443 4014
Email address:	solomonailwei@yahoo.com
Research Topic:	Barriers in managing environmental education projects in primary and secondary Alexandra Township Schools.
Number and type of schools:	13 Primary Schools and Seven Secondary Schools and Johannesburg East District
District/s/HO	Johannesburg East

Re: Approval in Respect of Request to Conduct Research

This letter serves to indicate that approval is hereby granted to the above-mentioned researcher to proceed with research in respect of the study indicated above. The onus rests with the researcher to negotiate appropriate and relevant time schedules with the school/s and/or offices involved to conduct the research. A separate copy of this letter must be presented to both the School (both Principal and SGB) and the District/Head Office Senior Manager confirming that permission has been granted for the research to be conducted.

2014/08/04

The following conditions apply to GDE research. The researcher may proceed with the

1

Making education a societal priority

above study subject to the conditions listed below being met. Approval may be withdrawn should any of the conditions listed below be flouted:

1. The District/Head Office Senior Manager/s concerned must be presented with a copy of this letter that would indicate that the said researcher/s has/have been granted permission from the Gauteng Department of Education to conduct the research study.
2. The District/Head Office Senior Manager/s must be approached separately, and in writing, for permission to involve District/Head Office Officials in the project.
3. A copy of this letter must be forwarded to the school principal and the chairperson of the School Governing Body (SGB) that would indicate that the researcher/s have been granted permission from the Gauteng Department of Education to conduct the research study.
4. A letter / document that outlines the purpose of the research and the anticipated outcomes of such research must be made available to the principals, SGBs and District/Head Office Senior Managers of the schools and districts/offices concerned, respectively.
5. The Researcher will make every effort obtain the goodwill and co-operation of all the GDE officials, principals, and chairpersons of the SGBs, teachers and learners involved. Persons who offer their co-operation will not receive additional remuneration from the Department while those that opt not to participate will not be penalised in any way.
6. Research may only be conducted after school hours so that the normal school programme is not interrupted. The Principal (if at a school) and/or Director (if at a district/head office) must be consulted about an appropriate time when the researcher/s may carry out their research at the sites that they manage.
7. Research may only commence from the second week of February and must be concluded before the beginning of the last quarter of the academic year. If incomplete, an amended Research Approval letter may be requested to conduct research in the following year.
8. Items 6 and 7 will not apply to any research effort being undertaken on behalf of the GDE. Such research will have been commissioned and be paid for by the Gauteng Department of Education.
9. It is the researcher's responsibility to obtain written parental consent of all learners that are expected to participate in the study.
10. The researcher is responsible for supplying and utilising his/her own research resources, such as stationery, photocopies, transport, faxes and telephones and should not depend on the goodwill of the institutions and/or the offices visited for supplying such resources.
11. The names of the GDE officials, schools, principals, parents, teachers and learners that participate in the study may not appear in the research report without the written consent of each of these individuals and/or organisations.
12. On completion of the study the researcher/s must supply the Director: Knowledge Management & Research with one Hard Cover bound and an electronic copy of the research.
13. The researcher may be expected to provide short presentations on the purpose, findings and recommendations of his/her research to both GDE officials and the schools concerned.
14. Should the researcher have been involved with research at a school and/or a district/head office level, the Director concerned must also be supplied with a brief summary of the purpose, findings and recommendations of the research study.

The Gauteng Department of Education wishes you well in this important undertaking and looks forward to examining the findings of your research study.

Kind regards

Makhado

Dr David Makhado
Director: Education Research and Knowledge Management

DATE: 2014 / 08 / 04

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Making education a societal priority

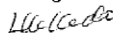**Office of the Director: Knowledge Management and Research**
9th Floor, 111 Commissioner Street, Johannesburg, 2001
P.O. Box 7710, Johannesburg, 2000 Tel: (011) 355 0506
Email: David.Makhado@gauteng.gov.za
Website: www.education.gpg.gov.za

APPENDIX 3
LETTER OF INVITATION

Date: _____

Studies: **Doctoral studies**   **Supervisor: Prof. LDM Lebeloane**

LETTER OF INVITATION

My name is Ailwei Solomon Mawela and I am a Doctoral student at UNISA in the DoE. This letter serves to request you to participate in a research study that will assist me in completing my dissertation research.

This study will be supervised by Prof. LDM Lebeloane. The study demands completion of a questionnaire. I am requesting your assistance in completing the instrument voluntarily. The title of the study is "Barriers to managing environmental education projects in Alexandra Township primary and secondary Schools". The purpose of this study is to find suggestable measures that can be used in dealing with barriers to managing environmental education projects in schools.

It is essential that you understand that your participation in this study is voluntary. You may opt to refuse to participate or to participate in the research, there is no penalty or loss of benefits to which you are entitled, and you may choose to discontinue in your participation at any time without penalty or loss of benefits. The results of the instruments will contain no identifying information that may cause harm to your reputation and all data will be kept confidential. The final results of the study will be kept at UNISA and will not contain any identification information.

You are welcome to communicate with the researcher, that is, if you have any injuries you would like to make with regard to this research project.
Telephone: 0764132156/0717491400
Email address: solomonailwei@yahoo.com

As a way of showing interest in participating in this research study, please sign the informed consent letter under appendix: 5 and hand back to the researcher (Mr. A.S. Mawela)

Thanking you in advance for your availability and the information provided as a participant in this research study.

Mr. A.S. Mawela

PARTICIPANTS CONSENT FORM

Date: _____

Studies: **Doctoral studies**   **Supervisor: Prof. LDM Lebeloane**

Information Consent   <u>Respondent Consent Form</u>

Principal investigator: <u>Ailwei Solomon Mawela</u>

Potential Risks or Discomforts:

The project principal investigator rest assure all participants of no risks or discomforts that they may experience during and after the investigation.

Potential Benefits to participants and others.

The purpose of this research is to investigate the "Barriers to managing environmental education projects in Alexandra Township Primary and secondary schools" in order to identify barriers that schools are facing with when they are managing EE projects, find causes and possible solutions that will assist schools in mitigating those barriers. Besides that, subject facilitators and institutional development officers will be asked on barriers that schools are encountering when managing environmental education projects and the possible solutions. The outcome of this research will also bring forth the awareness to school principals/ educators, subject facilitators and IDSOs on how environmental education can easily be integrated to various subjects for the benefit of managing environmental education projects in schools.

Alternative Procedures: Participating in this research project is voluntarily. There are no alternative procedures that are hidden to the participants. Participants are entitled to participate willingly and also to withdraw from participating at any time without consequences.

Protection of confidentiality:

The primary researcher and the dissertation supervisor will have access for the raw gathered data. Acknowledgement of the consent form will be placed with the collected

data. The data will be retained without any indicators, on the personal computer and on the backup external hard drive of the research.

Signature and Consent to Participate

UNISA research procedures require that we obtain signed consent for the conduct of social research and for participation in research projects which involve human subjects. After this study's purpose, procedures, potential risks, discomforts, and benefits have been explained to you, Please indicate your consent by reading and signing the statements below.

I have been fully informed of the above- described procedures with its possible benefits and I have given my permission to participate in this research study.

_____   _____

Surname and Name of Participant   Signature of participant

_____   _____

Surname and Name   Signature of Principal investigator

_____

Date

RESEARCH INSTRUMENT
QUESTIONNAIRE TO BE COMPLETED BY SCHOOL PRINCIPAL

Research question:

Barriers to managing environmental education projects (EEP) in Alexandra Township primary and secondary schools

Introduction:

The researcher is a Doctoral student at UNISA who is currently conducting an investigation in the field of environmental education. The topic of the study is: barriers to managing environmental education projects in Alexandra Township primary and secondary schools. You are asked to honestly respond to the following questions. The information collected will form part of the doctoral research project. All of the information you give will be kept confidential. Your name and particulars will not be disclosed to anyone. The completion of the questionnaire could take at least 30 minutes.

Purpose:

The purpose of the questionnaire is to assess school principal/educators understanding, experience, knowledge and skills on "Barriers to managing environmental education projects in Alexandra Township primary and secondary schools".

Section A: Bibliographic information of the school Principal

School Name	
Address	
Telephone number	
School Principal	
EE committee coordinator	

Which grades are you teaching?	
Which subjects do you teaching?	
Teaching experience	
Highest Qualification	

Table: 2 (Bibliographic information of the school Principal and educator)

Section B: School environmental education projects

NB: Make use of extra paper if there be a need to elaborate more.

1.1.   Does your school have environmental education projects? And if your answer is yes, what are they and what are the reasons of initiating them?

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1.2.   Is the environmental education projects indicated above, well managed in your school? And to what extent are they being managed?

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1.3   Do you experience any barriers in managing the environmental education projects in your school? If yes, what are those barriers that you are experiencing when managing environmental education projects in your school?

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1.4   What do you think could be the causes of barriers in managing environmental education projects in your school?

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1.5   What do you think could be the possible solutions to the barriers to managing environmental education projects in your school?

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Thanking you in advance for you availability and the information provided as a participant in this research study.

Mr. A.S. Mawela

RESEARCH INSTRUMENT:

QUESTIONNAIRE TO BE COMPLETED BY SCHOOL EDUCATORS IN ENVIRONMENTAL EDUCATION COMMITTEE

Research question:

Barriers to managing environmental education projects (EEP) in Alexandra Township primary and secondary schools

Introduction:

The researcher is a Doctoral student at UNISA who is currently conducting an investigation in the field of environmental education. The topic of the study is: barriers to managing environmental education projects in Alexandra Township primary and secondary schools. You are asked to honestly respond to the following questions. The information collected will form part of the doctoral research project. All of the information you give will be kept confidential. Your name and particulars will not be disclosed to anyone. The completion of the questionnaire could take at least 30 minutes.

Purpose:

The purpose of the questionnaire is to assess school principal/educators understanding, experience, knowledge and skills on "Barriers to managing environmental education projects in Alexandra Township primary and secondary schools".

Section A: Bibliographic information of the school Educator

School Name	
Address	
Telephone number	
Fax number	
School Principal	
EE committee coordinator	
Which grades are you teaching?	
Which subjects do you teaching?	

Teaching experience	
Highest Qualification	

Table 3 (bibliographic information of the school Principal and Educator)

Section B: School environmental education projects

NB: Make use of extra paper if there be a need to elaborate more.

1.1.   Does your school have environmental education projects? And if your answer is yes, what are they and what are the reasons of initiating them?

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1.2.   Is the environmental education projects indicated above, well managed in your school? And to what extent are they being managed?

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1.3.   Do you experience any barriers in managing the EE projects in your school? If yes, what are those barriers that you are experiencing when managing environmental education projects in your school?

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1.4.   What do you think could be the causes of barriers in managing environmental education projects in your school?

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1.5.   What do you think could be the possible solutions to the barriers to managing environmental education projects in your school?

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Thanking you in advance for you availability and the information provided as a participant in this research study.

Mr. A.S. Mawela

APPENDIX 7

RESEARCH INSTRUMENT

QUESTIONNAIRE TO BE COMPLETED BY JOHANNESBURG EAST DISTRICT SUBJECT FACILITATORS

Research question:

Barriers to managing environmental education projects (EEP) in Alexandra Township primary and secondary schools

Introduction:

The researcher is a Doctoral student at UNISA who is currently conducting an investigation in the field of environmental education. The topic of the study is: barriers to managing environmental education projects in Alexandra Township primary and secondary schools. You are asked to honestly respond to the following questions. The information collected will form part of the doctoral research project. All of the information you give will be kept confidential. Your name and particulars will not be disclosed to anyone. The completion of the questionnaire could take at least 30 minutes.

Questionnaire to be completed by Johannesburg East District Subject Facilitators

Purpose:

The purpose of the questionnaire is to assess district 9 (Johannesburg East) Subject facilitators understanding, experience, knowledge and skills on "barriers to managing environmental education projects in Alexandra Township primary and secondary schools". It is required that interviewed subject facilitators answer questions based on honesty.

Section A: Bibliographic information of the Subject Facilitators

District Name	
Address	
Telephone number	
Fax number	
District Director	
Name & Surname of curriculum facilitators	
Email address	
Subject that you facilitate	
Highest Qualification	
Your experience in education	

Table 4 (bibliographic information of the subject facilitators from Johannesburg east district)

Section B: Involvement of curriculum facilitators into the management of EEP in schools.

NB: Make use of extra paper if there be a need to elaborate more.

2.1.   Do schools that you interact with as a subject facilitator have environmental education Projects? And if your answer is yes, what are they and also mention reasons of initiating them?

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2.3.   Are schools able to manage environmental education projects? if yes, to what extent are they being managed?

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2.5   Have you identified some of the barriers that the schools are experiencing when managing environmental education projects? And if yes, what are those barriers to managing environmental education projects in schools?

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2.6.   What do you think could be the causes of barriers to managing environmental education projects in schools?

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2.7.   What do you suggest as possible solutions for the barriers to managing environmental education projects in schools?

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2.8.   Which form of assistance do you offer to schools as a way of mitigating barriers to managing environmental education projects in schools?

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Thanking you in advance for you availability and the information provided as a participant in this research study.

Mr. A.S. Mawela

APPENDIX 8

RESEARCH INSTRUMENT

QUESTIONNAIRE TO BE COMPLETED BY JOHANNESBURG EAST DISTRICT INSTITUTIONAL DEVELOPMENT SUPPORT OFFICER

Research question:

Barriers to managing EEprojects (EEP) in Alexandra Township primary and secondary schools

Introduction:

The researcher is a Doctoral student at UNISA who is currently conducting an investigation in the field of environmental education. The topic of the study is: barriers to managing environmental education projects in Alexandra Township primary and secondary schools. You are asked to honestly respond to the following questions. The information collected will form part of the doctoral research project. All of the information you give will be kept confidential. Your name and particulars will not be disclosed to anyone. The completion of the questionnaire could take at least 30 minutes.

Purpose:

The purpose of the questionnaire is to assess Johannesburg east District IDSOs' understanding, experience, knowledge and skills on "barriers to managing environmental education projects in Alexandra Township primary and secondary schools".

Section A: Bibliographic information of the IDSO

District Name	
Address	
Telephone number	
Fax number	
District Director	
Name & Surname of IDSO	

Email address	
Number of schools in your cluster	
Highest Qualification	
Your experience in education	

Table 5 (bibliographic information of the institutional developmental support officers from Johannesburg east district)

Section B: Involvement of Institutional development support officer in managing EEP in schools.

NB: Make use of extra paper if there be a need to elaborate more.

3.1.   Do schools under your cluster have environmental education projects? And if your answer is yes, would you mention some of them and reason of them being initiated?

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3.3.   Are the environmental education projects in schools under your cluster well managed? Substantiate your answer by explaining the possible causes of the barriers to managing environmental education projects in schools?

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3.4. Based on your observation of the management of the environmental education projects in schools, do you think school principals and educators have enough knowledge and skills to manage environmental projects, if no, which skills are required?

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3.5. As an institutional development support officer, what form of intervention do you offer to manage environmental education projects in schools?

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3.6. Indicate some of the possible solutions that you think are essential to mitigate barriers to managing environmental education projects in schools.

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Thanking you in advance for you availability and the information provided as a participant in this research study.

Mr. A.S. Mawela

NUMBER OF INSTITUTIONS PARTICIPATED IN THE RESEARCH

Type of Institution	Total
Primary Schools	**12**
Secondary Schools	**6**
ABET Centers	
ECD Sites	
LSEN Schools(primary)	**1**
Further Education & Training Institutions	
Other	
GRAND TOTAL	**19**

Table 6.3 list of participating schools' details

APPENDIX 9

DECLARATION BY SUPERVISOR / PROMOTER / LECTURER

DECLARATION BY SUPERVISOR / PROMOTER / LECTURER	
I declare that: - 1. *The applicant is enrolled at the institution / employed by the organisation to which the undersigned is attached.* 2. *The overall research processes meet the criteria of:* • *Educational Accountability* • *Proper Research Design* • *Sensitivity towards Participants* • *Correct Content and Terminology* • *Acceptable Grammar* • *Absence of Non-essential / Superfluous items*	
Surname:	**LEBELOANE LDM**
First Name/s:	**OUPA**
Institution / Organisation:	**University of South Africa**
Faculty:	**College of Education**
Department:	**Didactics**
Telephone:	**012 4294433**
Fax:	**0866133903**
Cell:	**0834538148**
E-mail:	**lebelldm@unisa.ac.za**
Signature:	
Date:	**2016.06.15**

APPENDIX 10
THEMATIC ANALYSIS OF DATA

Research Question	Summary of the responses	Emergent Categories	Emergent themes
1.1. Environmental education projects in schools.	"The purpose of establishing vegetables garden is to supplement the food supplied by Gauteng department of education as part of nutrition programme in schools". (Principals AP#1-10 & BP#1-4) "Our aim of recycling EE project is to generate funds for the school in order to meet other needs of the school" (principal AP#7-13) "we do have number of schools that have recycling EE projects, even though there are certain challenges that need to be addressed" (SF#1 & IDS#3) "We are aiming at the cleanliness of school toilets, corridors and classes" (School educators AE#3-8 & BE# 4-5) "The project aimed at improving schools hygiene and protecting learners from being infected by diseases unnecessarily. She also indicated that general assistance workers, employed by department of education should make the cleanliness of the schools their priority number one" (Facilitator HSF#1) "Parents, learners and staff plant trees around the school as part of greening the school surrounding" (School principal AP#9) "Schools engage in this project more especially during the arbour day" (facilitator HSF#1) " This project is aiming at making sure that learners and parents receive special health treatment for eye, ear and dental care, HIV and Aids, blood pressure, and diabetes" (School principal AP#1)	**Vegetable garden EE project** - Lack of space - Staff reluctance to participate - Shortage of water for irrigation **Recycling EE project** - Lack of dustbins - Educators reluctance **Clean-up/ Sanitation EE project** - Poor water pressure - Staff reluctance - poor participation from staff & parents **Bontle ke Botho "beautification is human" EE Project** - Lack of space - Poor educators & staff participation **Integrated school health EE project** - Lack of sponsorships - Too many learners diagnosed with several sicknesses **Baswa le Metsi EE project "youth and water project"** - Lack of involvement by educators **Safe playground and violence prevention EE project**	Environmental education projects in schools

	"Our learners with short sightedness are treated by specialists and receive medication or glasses. Our learner's performances improve annually" (educator AE#1)	- Unavailability of educators during break duty - Parents not involved in enforcing learner discipline	
	"We intend to bringing awareness amongst learners with regard to the wise usage of water" (principals AP# 3-7)	**Feeding scheme EE projects** - Educators late coming - Not available at Secondary schools	
	"The project does not get the attention it deserves since, schools only respond to the call of the water week awareness once in a year" (facilitator HSF#1)		
	"Learners bring dangerous weapons to school, such as panga and guns from home, and they end up hurting one another" (educators BE#3&4)		
	" The effectiveness of the project is very much minimal since, most educators during break time hardly adhered to the break duty time table and not interested in extra and co-curricular activities" (principals AP#1-3) and (BP#1&2)		
	"Our school has both tiger brands and GDE feeding schemes; we feed learners in the morning while sitting in classes and offer lunch late during the day" (Principals AP#1-13 & educators AE#1-13)		
	"The project aimed at eliminating the nutritional problems facing most of the learners from disadvantaged families daily" (IDS#1)		

1.2. Are the environmental education projects indicated above, well managed in your school? And to what extent are they being managed?	"There is lack knowledge and skills on how to manage EE projects and that is the reason we prefer to partner with non-governmental organization for their expertise" (Educators AE#5-12 & BE#1- 2) "School principals and educators are unable to manage EE projects because they were never trained at college nor receive in-service training after being employed as professional educators"(IDS# 1) "In order to manage EE projects the department should provide us with resources such as enough general assistance and allocate funds in our resource allocation specifically for EE project" (principals AP#1-7 & BP#1-4) "In some schools principals are unable to budget for EE projects and to even to plan the Project" (SF#2)	Barriers to managing EE projects in schools - Reluctance from educators - Lack of skills - Lack of knowledge - Lack of support - Lack of ownership Causes of barriers to manage EE projects in schools - Lack of funds - Lack of planning - Lack of organization - Inadequate time allocated for EE projects	Management of environmental education projects in schools
1.3. What do you think could be the possible solutions to the barriers to managing environmental education projects in your school?	"School management team should pass regulation that will force the hawkers to sell and to commit themselves to cleaning the schoolyard as part of taking responsibility towards cleanliness of the school" (educators AE# and BE#4 and SF#1-4) "Environmental Education projects are time consuming, since we have curriculum based subjects that we must complete at a set duration" (educator BE#5) "We are not being consulted with regard to policy making and how EE themes should be integrated into the curriculum subjects" (educators AP#1-10 and BE#1-5) "We are unable to manage EE projects just because we are not receiving any kind of training or workshop" (educators AE#11-13 and BE#1-4)	Role of school management and stakeholders - Partnering with stakeholders - provision of funds to schools - Introducing EE as a subject Position of educators in EE projects - Training/workshop to educators - Provisioning guideline policy	Possible solutions

| 1.4 What kind of assistance offered by subject facilitators and IDSO's? | "As much as we are not directly involved in the management of EE projects in school, but we are expected to give guidelines on how to integrate environmental education themes in the current curriculum subjects "(SF#1-4)

"Those who are teaching tourism, I encourage them to integrate EE projects into tourism" (SF#1)

"We also do not have the necessary knowledge and skills on how to manage environmental education projects since it is not our area of specialization" (ID#1-5) | Role of subject facilitators in EE projects
- Integration of EE into curriculum subjects
- Guiding educators into initiating EE projects
- Provide strategies on managing EE projects

Role of institutional development support officers
- Assist principals in developing EE policy
- Mentor principals on EE Management
- Suggest necessary budget strategies | |