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TEACHERS' PERCEPTION OF THE INTEGRATION OF ENVIRONMENTAL EDUCATION INTO GRADE 12 CURRICULUM IN EAST LONDON EDUCATION DISTRICT

Dissertation Submitted in fulfilment of the requirements for the degree

MASTER OF EDUCATION

University of Fort Hare

Faculty of Education

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2019

ABSTRACT

The study focuses on teachers' perception of the integration of environmental education into grade 12 curriculum in East London education district. This study is based on empirical research. The theoretical framework of the study is based on Opportunity to Learn (OTL). The concept of OTL was formulated by international Association of Achievements (McDonnell, 1995).OTL is multiplicity of factors that create the conditions for teaching and learning, such as curricula, learning materials, facilities, teachers and instructional experiences. The research study is supported by national and international literatures based on environmental education and integration of environmental education as a component in the school curriculum, and policy documents. The study adopted qualitative research approach, using phenomenological method and interpretivism paradigm respectively. The empirical data was collected from one high school in Mdantsane Township in East London education district. The study sample consisted of 6 high school teachers. Data was collected through semi- structured interviews. According to the findings of the research, grade 12 teachers expressed disparities in their perceptions of environmental education as an integrated component into their subjects. Most of the subject teachers focused on the aspect of knowledge acquisition. According to South African education system, environmental education (EE) has been integrated into all subjects. Although there is environmental education in the GET and FET phase curriculum respectively, however it is not integrated evenly in all subjects. Some subjects like Life sciences, geography have more environmental content than other subjects. Teachers suggested that the approach adopted to integrate environmental education into the school curriculum was not favourable because teachers claimed that what is to be taught as environmental education in the various subjects is not indicated explicitly in the CAPS document. The CAPS document prescribes EE integration into all subjects which makes the teaching of EE a collective responsibility. The main actors of EE integration implementation are themselves a constraint to the success of the integration. The teacher is confronted with many challenges in the process of environmental education integration. This includes lack of teaching and learning resources, time and large class size. The role of teachers in the implementation of environmental education in developing an environmentally literate citizenry is of great significance. The responsibility of the government in

developing a curriculum with clear goals and content, developing teachers' capacity in the teaching of environmental education and provision of teaching and learning materials needs to be taken seriously by the government in educational plans and programs. Topics for future research on the integration of EE into grade 12 curriculums were suggested in order to improve on teaching and learning of environmental education.

Key terms: Environmental education, integration, curriculum, perception, grade 12

DECLARATION ON PLAGIARISM

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ACKNOWLEDGEMENTS

To God be the glory for great things He has done and the greater things He is yet to do. Truly, for in him we live and move and have our being. I am very much grateful to our heavenly father for seeing me through this study and making my dream a reality.

Writing a dissertation is a challenging task, but it has been made possible as a result of the overwhelming support and encouragement I received from many people who are dear to my heart. I would like to express my heartfelt gratitude to my supervisor Professor Emmanuel Olusola Adu, for being a mentor, a role model and a father throughout this study. May the Lord replenish whatever he has lost in thousand folds. My sincere thanks also go to Professor Greta Galloway whose professional expertise saw me through my research proposal.

My profound appreciation goes to Mr. and Mrs. Busumru-Banson for their guidance, inspiration and encouragement in all challenging moments. I owe many thanks to Mr. and Mrs.Adu Damoah for their mentorship, guidance and support for the past decade. My appreciation also goes to Dr. Emmanuel Duku for his inspiration and support for the past years. I extend my sincere appreciation to Rev. Philip Ntim Marfo and Mama Ivy Marfo for their moral and spiritual support.

I would like to express my profound gratitude to my family for supporting me throughout my studies. Special thanks to my wife who have always been there for me, Mrs. Ruth Damoah. I particularly would like to thank my children Annalisa Afriyie Damoah, Kendrick-Manuel Damoah and Enoch Adom Damoah, for their understanding and encouragement during the time of my study.

Last, but not least, my sincere appreciation goes to all colleagues at Trimax Education Centre, the school administrator Mr. A.N Nketiah to them I owe many thanks, and may I say that I greatly value their contribution towards the success of my studies. This study would not have been made possible without the participation of the SIX (6) high school teachers in one public school where I conducted the study. I am much grateful for your participation and support at the field. May the manifold blessings of the most high God be your portion.

DEDICATION

I dedicate this dissertation to my adorable mother Madam Janet Yeboah who worked tirelessly for me to be educated. I shall forever be indebted to you. Also to my lovely wife Mrs. Ruth Damoah, my pretty daughter Annalisa Afriyie Damoah and my two soldiers Kendrick-Manuel Damoah and Enoch Adom Damoah, not forgetting my father Mr. B.K Damoah and five sisters Matilda Adubea Damoah, Cindy Bentil Damoah, Regina Damoah, Christiana Damoah and Juliet Damoah, whom when I see gives me strength to forge ahead and persevere in difficult times.

TABLE OF CONTENTS

ABSTRACT i

DECLARATION OF PLAGIARISM,,iii

DECLARATION OF COPYRIGHT.....iv

ACKNOWLEDGEMENTS v

DEDICATION..... vi

CHAPTER ONE..... 1

INTRODUCTION & BACKGROUND TO THE STUDY 1

1.1 INTRODUCTION & BACKGROUND TO THE STUDY 1

Global Views on Integration of Environmental Education 4

1.1.1 Integration of Environmental Education in school curriculum in Serbia..... 6

1.1.2 Integration of Environmental Education in the school curriculum in China 6

1.1.3 Integration of Environmental Education in the school curriculum in Australia 6

1.1.4 Integration of Environmental Education in the school curriculum in Tanzania 7

1.1.5 Integration of Environmental Education in the school curriculum in Nigeria..... 7

1.2 SOUTH AFRICAN VIEWS ON INTEGRATION OF ENVIRONMENTAL EDUCATION . 8

1.2.1 Integration of Environmental Education into the school curriculum in South Africa. 8

1.2.2 Approach to EE integration into the South African School Curriculum 9

1.3 STATEMENT OF THE PROBLEM 10

1.4 The purpose of the Study..... 11

1.5 SIGNIFICANCE OF THE STUDY 12

1.6 DELIMITATIONS/SCOPE OF THE STUDY..... 12

1.7 RESEARCH QUESTIONS..... 13

1.7.1 Main Research Question..... 13

1.7.2 Sub-Research Questions..... 13

1.8 OBJECTIVES OF THE STUDY 13

1.9 Definition of key terms 13

1.9.1 Environmental Education 13

1.9.3 Integration 14

1.9.4 Curriculum 15

1.9.4 Perception 15
1.9.5 Grade 12 15
1.10 RESEARCH METHODOLOGY 15
1.10.1 Research paradigm 16
1.10.2 Research approach 16
1.10.3 Research design 17
1.10.4 Sample and sampling techniques 18
1.10.5 Data Collection Instrument 19
1.10.6 Data analysis 20
1.10.7 Trustworthiness 20
1.11 ETHICAL CONSIDERATIONS 20
1.11.1 Informed Consent 21
1.11.2 Confidentiality and Anonymity 21
1.11.3 Voluntary Participation 22
1.12 CONCLUSION 22
1.13 Chapter Outline 22
CHAPTER TWO 24
THEORETICAL FRAMEWORK AND LITERATURE REVIEW 24
2.0 Introduction 24
2.1 THEORETICAL FRAMEWORK 24
2.2 ENVIRONMENTAL EDUCATION AS A COMPONENT OF THE SCHOOL CURRICULUM 32
2.3 TEACHERS' AWARENESS OF EE 34
2.3.1 Environmental Education and Economic Growth 35
2.3.2 Environmental awareness in China 35
2.4 TEACHERS' AWARENESS OF EE INTEGRATION IN THE SCHOOL CURRICULUM 37
2.5 TEACHERS' AWARENESS OF EE INTEGRATION ACROSS THE CAPS CURRICULUM 38
2.6 METHODS OF DELIVERY OF THE CONTENT OF EE 39
2.6.1 Teaching methods 40
2.6.2 Teacher-Centred Approach 41

2.6.3 Learner-Centred Approach 42
2.6.4 High Tech Approach 42
2.6.5 Low Tech Approach 43
2.6.6 The Authority or lecture Approach 44
2.6.7 Demonstrator or coach style 44
2.6.8 The Facilitator or activity style 45
2.6.9 The Delegator or group style 45
2.6.10 The Hybrid or blended style 45
2.6.11 What teaching methodology is best for today's learners? 46
2.7 TEACHING METHODS OF EE 46
2.7.1 Significance of teaching methods of EE 48
2.8 CHALLENGES AND LIMITATIONS TEACHERS FACE IN THE INTEGRATION OF EE INTO THE GRADE 12 CURRICULUM 49
2.9 SOUTH AFRICAN CONTEXT 51
2.10 CONCLUSION 52
CHAPTER THREE 53
RESEARCH METHODOLOGY 53
3.0 INTRODUCTION 53
3.1 RESEARCH APPROACH 53
3.1.1 Dimension of Qualitative Research 54
3.2 RESEARCH PARADIGM 61
3.2.1 Interpretivist paradigm 61
3.3 RESEARCH DESIGN 65
3.3.1 Phenomenological method 65
3.4 SAMPLE AND SAMPLING TECHNIQUES 67
3.4.1 Sample 67
3.4.2 Sampling techniques 68
3.4.3 Purposive sampling 68
3.5 DATA COLLECTION METHODS 71
3.5.1 Interviews 71
3.6 METHODS OF RESEARCH INTERVIEWS 76

3.7 DATA ANALYSIS 80
3.7.1 Inductive style 80
3.7.2 The process of inductive coding 80
3.8 DATA TRUSTWORTHINESS 82
3.8.1 Member checking strategy 82
3.8.2 Prolonged and persistent fieldwork strategy 82
3.8.3 Mechanically recorded data 82
3.9 ETHICAL CONSIDERATIONS 83
3.9.1 Informed Consent 83
3.9.2 Confidentiality and Anonymity 83
3.9.3 Voluntary participation 84
3.9.3 Data analysis 84
3.10 CONCLUSION 84
CHAPTER FOUR 85
DATA ANALYSIS AND PRESENTATION 85
4.0 INTRODUCTION 85
4.1 THE BACKGROUND OF THE SAMPLED SCHOOL 85
4.2 OVERVIEW OF RESPONDENT'S PROFILE 87
4.3 THE GENDER OF THE RESPONDENTS 88
4.3 QUALIFICATIONS AND EXPERIENCES OF THE RESPONDENTS 89
4.3.1 Presentation and Analysis of Data Gathered Through Semi-Structured Interviews 90
4.3.2 Teachers' Awareness of EE Integration in the School Curriculum 90
4.4 EE AS TEACHING AND LEARNING MATERIAL 93
4.4 TEACHERS' UNDERSTANDING OF EE INTEGRATION IN THE SCHOOL CURRICULUM 95
4.5 HOW TEACHERS INTEGRATE EE INTO THEIR RESPECTIVE SUBJECTS 100
4.5 IMPORTANCE OF EE INTEGRATION INTO THE GRADE 12 CURRICULUM 104
4.6 Challenges teachers face in the integration of EE into the curriculum 111
CHAPTER FIVE 120
CONCLUSION, FINDINGS AND RECOMMENDATIONS 120
5.1 INTRODUCTION 120

5.2 SUMMARY OF THE RESEARCH FINDINGS 120
5.2.1 Teachers' awareness of EE integration in the school curriculum 121
5.2.2 Teachers understanding of EE integration in the school curriculum 121
5.2.3 How teachers integrate EE into their respective subject area 122
5.2.4 The importance of EE integration into the Grade 12 curriculum 123
5.2.4 Challenges teachers face in the integration of EE into the curriculum 124
5.2.5 Document analysis 125
5.3 RECOMMENDATIONS 126
5.3.1 Re-alignment of the CAPS document 126
5.3.2 Environmental Education should remain as an integrated subject 127
5.3.3 Environmental Education Subject advisors needed at district offices 127
5.3.4 Environmental Education training in Universities and Colleges 128
5.3.5 Government intervention in EE teaching and learning 129
5.4 LIMITATIONS TO THE STUDY 129
5.4.1 Selection of one school 129
5.4.2 Language Barrier 129
5.4.3 Respondents' unwillingness to participate in the study 130
5.4.4 Undue delay of the Ethical Clearance Certificate from University of Fort Hare 130
5.4.4 Undue delay of the permission letter from the Department of Education 130
5.5 SUGGESTIONS FOR FURTHER STUDY 131
5.6 CONCLUSION 131
APPENDICES 148
APPENDIX A: INTERVIEW SCHEDULE FOR GRADE 12 TEACHERS 148
APPENDIX B: PERMISSION TO CONDUCT RESEARCH 151
APPENDIX C: DEPARTMENT OF EDUCATION'S APPROVAL LETTER TO CONDUCT RESEARCH 152
APPENDIX D: ETHICS RESEARCH CONFIDENTIALITY AND INFORMED CONSENT FORM 154
APPENDIX E: LANGUAGE EDITING CERTIFICATE 156
APPENDIX F: ETHICAL CLEARANCE CERTIFICATE 157

CHAPTER ONE

INTRODUCTION & BACKGROUND TO THE STUDY

1.1 INTRODUCTION & BACKGROUND TO THE STUDY

Quality teaching and learning of environmental education through a formal education curriculum is one of the main responses to the deteriorating state of the global environment. According to McDonald (2004), the advent of constitutional rule in the South African political arena has brought about new direction in dealing with environmental concerns. Agreeing with Adu (2015), education plays important role in ensuring sustainable development.

According to the Council for Scientific and Industrial Research (2004), Section 24 of the Constitution of the Republic of South Africa (RSA, 1996) legally mandates the government to ensure that people in South Africa are not harmed by the environment and the environment is protected against abuse. The CSIR (2004) document implies that government and other stakeholders are to initiate and implement measures to preserve and protect the Environment from further degradation. Based on the backdrop of this Constitutional requirement as enshrined in Section 24 of 1996, South African Constitution, Environmental Education (EE) has been incorporated in all disciplines of the entire school curriculum both GET and FET phase of South African Education system.

Galloway (2004) indicated that post-apartheid curriculum has undergone transformation to meet the needs of the society. She further argued that the paradigm shift in the education system should equip learners to act as responsible citizens. Environmental Education (EE) is integrated into South African school curriculum from the General Education and Training (GET) from Grade R to 9 and Further Education and Training (FET) phases. Fundamental human rights, social justice and healthy environment are embedded in the curriculum. While a cross-curricula approach to teaching and learning is followed in the GET phase, environmental concerns are infused in each subject at FET level (Dube, 2012).

In 1989, the inclusion of EE into formal education created an uproar; as a result, a white paper 6 was tabled at the South African parliament. Although it received some

resistance from state education institutions, the state finally adopted the Tbilisi UNESCO, 1997 declaration and the internationally acceptable approach for Environmental Education in the curriculum (Lotz-Sisitka & Irwin, 2005).

The South African post-apartheid Curriculum 2005 (C-2005) has undergone a series of curriculum revisions over the years. C-2005 was reviewed in June 2000 after its inception in January 2000 because of flaws in the curriculum design and its implementation. The review process led to the introduction of curriculum 21, known as the National Curriculum Statement (NCS), which has given new thinking regarding EE integration into the South African school system (Curriculum 2005 Review Committee Report, 2000).

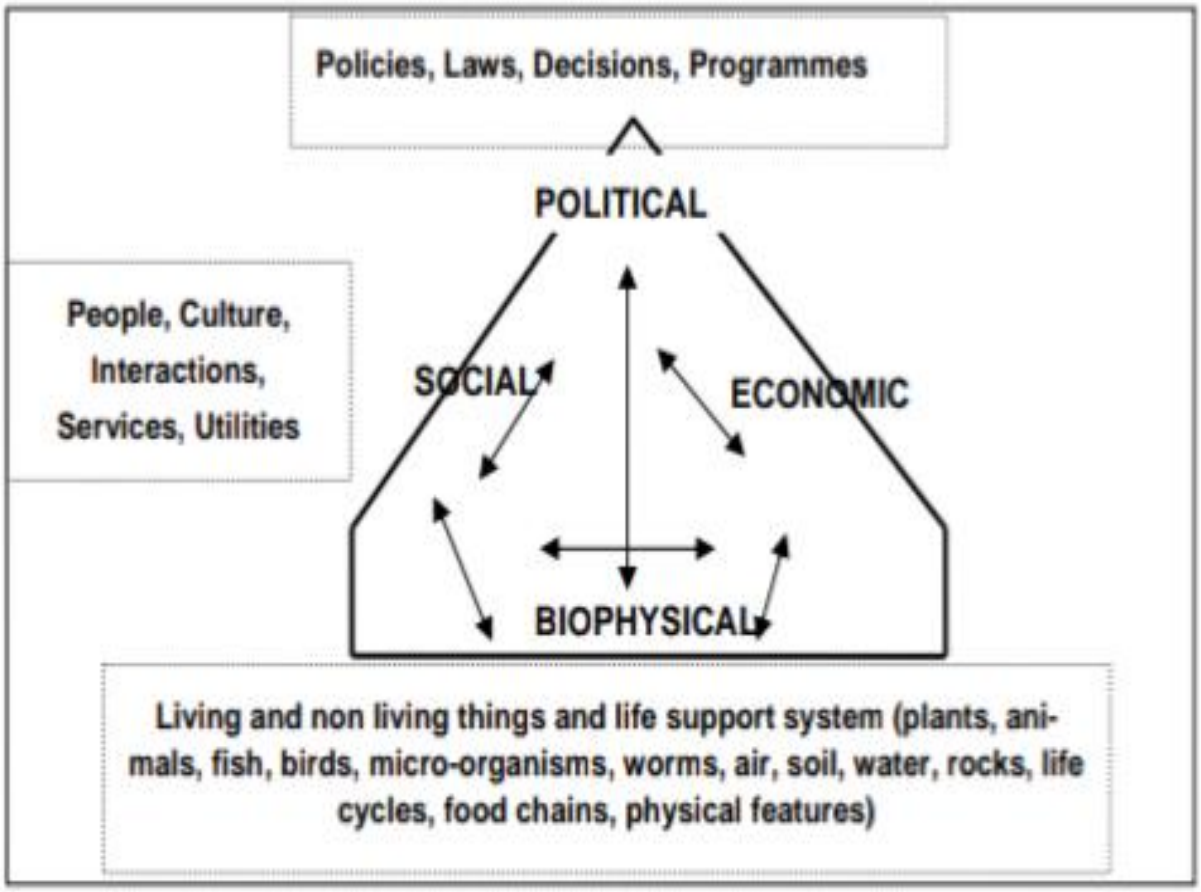
The NCS seeks to strike a balance of well-integrated curriculum and systematic progression of concepts (Hoadley & Jansen, 2009). The advent of NCS led to a subsequent review, in 2011, that is, a new revised curriculum introduced as National Curriculum and Assessment Policy statement (CAPS), currently the official document. The new policy document has placed much importance on the integration of EE by integrating environmental themes in all school subjects at the GET and FET phase, respectively (DoE, 2011).

In view with this goodwill, the South African education system recognizes EE as an important component of the entire school curriculum and not as a stand-alone subject. The role of every teacher, within the spirit of the CAPS document, is to arouse the interest of learners in environmental issues through the integration of EE themes into their respective subjects. This study, therefore, focused on Grade 12 teachers' perceptions of environmental education as an integrated component into subject areas of speciality.

Summers, Kruger, Childs and Mant (2000) state that, the rationale behind Environmental Education and Sustainable development is to reduce our carbon footprints and degradation. Environmental Education helps an individual to acquire knowledge, values and skills to make an informed decision in preserving the environment and improving the quality of life for today and the next generations to come. The researcher therefore analysed Global, Africa and South African views on EE.

According to Tal and Peled (2017), EE is a process that targets the developing of knowledge and skills about the environment in order to enhance its conservation. Environment is the totality of all aspects of the society and things that surround human beings. These things can be classified as biophysical, social, economic and political aspects, as indicated in the diagram below:

Figure 1.1 Interrelationship levels of the environment



Interrelationship levels of the environment (modified from O'Donoghue & Russo, 2004:337)

The above diagram shows interrelations of different levels of environment. The earth and its ecosystems are categorised under the biophysical level. The social dimension can be explained as people living together and systems in place that guide and keep people and the environment together. Economic dimension constitutes different areas of the economic sector, ranging from production, jobs and other activities that support good living.

Economic activities could have serious implications on the environment. For instance, human activities like mining bring huge economic growth; on the other hand, it can have negative effects on the environment if not checked. The political dimension can be governmental policies aimed at shaping the way of life of citizenry in order to sustain the environment (O'Donoghue & Russo, 2004). In view of this political dimension, the government of South African has taken stringent measures or policies to sustain the environment. One of such post-apartheid policies is the integration of EE across the entire school curriculum.

With regards to this study, the researcher defined environmental education as education that enables learners to be aware of their environment and take responsibility in its sustainability for future generations.

Global Views on Integration of Environmental Education

There are over one billion people starving to death as a result of over 1.2 billion hectares of land severely degraded by human activities (O'Riordan, 1995). This has necessitated the call for an integrated approach in the teaching of EE in the school curriculum to prepare people to be more competent and well sought-after to deal with environmental issues. According to Adu (2013), EE has shifted from engaging learners outside the classroom to learning about their immediate environs.

Environmental education has taken centre-stage in global intergovernmental conferences from the 1970s, as the world seeks alternative ways of addressing further environmental degradation. The first major international environmental conference from the 1960s to 1970s was the 1972, Stockholm Convention, coupled with the first UN Environmental Agency, United Nations Environment Programme (UNEP) established in 1973 (Barrow, 2005).

In the United Nations Conference held in Stockholm (1972), where the world's rich and poor nations came together to discuss matters of environmental concern, it was proposed that UNESCO and other environmental agencies take considerable measures in ensuring that EE is adopted and integrated across-curricular, globally (UNESCO, 1972).

EE should be incorporated across-curricular in the entire educational process at all phases to equip citizenry with the needed skills and knowledge for them to be agents of change (UNESCO, 1977). The Brundtland Report (1987), the Rio Earth Summit (1992) and the Johannesburg Summit (2002), and some global conferences articulated the need for EE was (Kimaryo, 2011:15).

In pursuance of the Stockholm Conference blueprint (1972), Agenda 21 is a policy document that emanated from the world stage Intergovernmental Earth Summit Conference held in Rio de Janeiro in 1992. The document gave clear direction to all states on how to achieve sustainable development in the twenty-first century.

One of the key components of the Agenda 21 policy was to urge all governments to integrate EE across the entire school curriculum (UNESCO, 1992). Integration of EE across the entire school curriculum is to develop learners' "knowledge, values, attitude, commitment and skills" to protect and improve the Environment. It could also encourage learners to examine and interpret Environmental issues from different perspectives. Subsequently, this could stimulate learners' "awareness and curiosity about the environment and encourage active participation in resolving environmental problems (NCC, 1990:6).

The change global international bodies state that EE should be integrated in school curriculum. According to Hua (2004), to ensure effective and results-oriented integrated EE, teachers who are major stakeholders should be well informed and conversant with Environmental issues.

According to Hua (2004), EE should focus on raising environmental awareness among students, and its content in the curriculum should meet the needs of the society. Environmental degradation of our environment affects everyone. It is, therefore, necessary for EE to be integrated in the school curriculum to inform and shape the thinking of learners. It is, therefore, imperative for teachers who influence such knowledge, skills and values in the learners, to have a clear interpretation and understanding of environmental education, as integrated in the various subjects in the school curriculum. Given the uncertainties in environmental issues, it is critical to examine teachers' environmental views that have direct bearing on their perception and teaching (Cotton, 2006). On this note, the study investigated how EE integration approach across-curricular is adopted and implemented, globally, into the school curriculum.

1.1.1 Integration of Environmental Education in school curriculum in Serbia

Stanisic and Maksić (2014), in their study, stated that EE is integrated across-curricular in different subjects in Serbia. Stanisic et al., agree with Hua (2004) that EE aims at building attributes and habits that make students to be environmentally literate. According the above-mentioned research study, many learners in primary schools are not familiar with environmental and other health related issues. In a nutshell, the study suggested that for the process of integration of EE to achieve the anticipated results, there should be proper training of teachers as facilitators of the curriculum. The study acknowledged the lapse of EE integration in Serbia; however, teacher's perceptions were not investigated in the study.

1.1.2 Integration of Environmental Education in the school curriculum in China

According to Hua (2004), the elementary school curriculum in China is subject-based. Hua further argued that the system allows individual schools to devise their own teaching plans according to the required hours for a course. In view of this, it is impossible to have EE as a stand-alone course in the curriculum. The researcher further states that, the finest approach to have EE in school is through integration by "organically incorporating" EE into various activities in different courses (Hua, 2004:50). He further indicated that teachers are to blend environmental themes in their lesson delivery to make learners environmentally literate. Hua emphasized that educators should be fully aware of the importance of EE and should be well-informed and conversant of EE integration. The success of EE integration largely depends on the teacher's perception and understanding.

1.1.3 Integration of Environmental Education in the school curriculum in Australia

According to Stevenson (2011), environmental degradation is a major environmental problem that poses serious threat to Australians. However, the Australian educational system has taken a different approach in the integration of EE into the school curriculum. In primary schools, integration of EE is done through EE programmes and in secondary schools, it is mostly integrated into Geography and the sciences. Stevenson (2011) further argued that global warming, pollution and deforestation are problems given the greatest concern by EE teachers both in primary and secondary schools.

In the Australian curriculum, for schools in the Victoria state, Outdoor and environmental studies are offered. Other learning areas that place much emphasis on EE include: Social Studies, Geography and Environmental Sciences. The content of EE integration in Australia largely depends on the curriculum focus of a specific learning area. EE implementation in the classroom depends on the “interest and priorities of a teacher” (Dyment, Emery & Hill, 2015:1108).

AFRICAN VIEWS ON INTEGRATION OF ENVIRONMENTAL EDUCATION

1.1.4 Integration of Environmental Education in the school curriculum in Tanzania

Tanzania has responded to the global call for integration of EE into their formal Education system. The Ministry of Education has designed environmental courses and integrated these officially in school curriculum at all levels (Mwendwa, 2017). Kimaryo (2011) and Mwendwa (2017) argued that Tanzania has adopted an integrated teaching approach to find solutions to the unending environmental problems confronting the nation. The study assessed the extent to which the Ministry of Education has incorporated EE in Tanzania. The research further evaluated the content of integration and explored perceptions of teachers and learners on the integration of EE into the school system. Mwendwa further states that most teachers lack clear understanding of EE integration, which directly affects the implementation of EE integration and the quality of lesson delivery. The study concluded that EE is mainly found in Geography and Biology, and integration is fairly inadequate in other subject areas.

1.1.5 Integration of Environmental Education in the school curriculum in Nigeria

Environmental education is considered as one of the ways of responding to global environmental problems. Nigeria, as a heterogeneous society and one of the biggest economies in Africa, is confronted with many environmental issues such as desertification, water and air pollution. According to Ovbiebo (2015), there is a need to integrate EE as a cross-curricular theme in Nigeria’s formal education system. This shall inculcate the right type of values and attitudes for the survival of the individual and the Nigerian society (Omo-Ojugo, Ibhafidon & Otote, 2009).

According to Omo-Ojugo, Ibhafidon and Otote (2009), to improve the environmental situation in Nigeria, the Federal Government has structured a curriculum underpinning EE integration from primary to tertiary educational systems. This was done by introducing a new component called *citizenship education* and also strengthening and integrating EE into social science subjects such as Geography, History, Government and Economics at the secondary school level. The integration of EE is therefore meant to raise the level of awareness and shape attitudes of the population through a well-designed school curriculum.

1.2 SOUTH AFRICAN VIEWS ON INTEGRATION OF ENVIRONMENTAL EDUCATION

South Africa, as a signatory to United Nations (UNESCO, UNEP and UNCED) international conferences, has responded to the global call and declarations by incorporating EE into the school-based curriculum at all phases. South African environmental policies and White paper on Environmental and Development (1995) support the incorporation of environmental education into the school curriculum. Prior to 1994, the burden of protecting and preserving the environment rested on the shoulders of conservation bodies and non-governmental organisations, thus neglecting the formal education system (Loubser, 2005).

1.2.1 Integration of Environmental Education into the school curriculum in South Africa

Implementing the Tbilisi Declaration (1977) and the Rio De Janeiro Agenda 21, the government of the Republic of South Africa has taken conscious efforts to integrate EE themes across curricular in the education system. The White Paper on Education and Teaching (1995) stipulated that an interdisciplinary approach should be adopted. EE should be incorporated into learning areas at all levels of formal education system and training to create environmentally literate and responsible citizens who shall conserve and protect scarce natural resources.

This, premised on the Constitution of the Republic of South Africa (1996), entrenched an Environmental content in the Bill of Rights Section 24. This states that every citizen has the right to an environment that is not harmful to their health or well-being and the environment should have protected for the benefit of present and future generations, through reasonable legislations and other measures.

In addition to the process of EE integration, the post-apartheid government showed preparedness to safeguard the environment by the initiation of a Green Paper on the environment (1996), which received the green light in 2001.The Green Paper urged the government to create awareness of environmental issues through the integration EE into the formal education system. UNESCO (2006) was emphatic that governments, curriculum developers and teachers have a crucial role in setting up activities and programmes that find solutions to the unending global environmental problems the world is facing today.

According to Galloway (2004), in any democratic dispensation, the quality of education is of utmost importance.The newly revised Curriculum and Assessment Policy Statement (2011), which came into effect in January 2012, is sensitive to environmental issues. The curriculum (2011) policy document emphasizes the need for EE integration across curricular in raising responsible citizens who shall be equipped with relevant EE knowledge, skills and attitudes to deal with emerging environmental issues.

According to Barrow (2009), environmental issues affect everyone, and its integration in the school curriculum cannot be downplayed. The new curriculum seeks to improve the quality of life of the citizenry through sustainability of the environment and its ecosystem. This can only be achieved through the integration of EE across the curriculum.

1.2.2 Approach to EE integration into the South African School Curriculum

The South African curriculum adopted the fusion approach of integration. Infusing refers to the integration of relevant content knowledge and skill into an existing subject without compromising the focus of the traditional subject itself. In the South African context, teachers are to analyse the content areas of their respective teaching subjects and look for places where environmental themes could be incorporated. The aim is to ensure that both EE and the subject or content are well taught without interfering with the integrity of the main subject (DoE, 2011).

UNESCO-UNEP (1994) affirmed that if EE themes are well taught and integrated effectively across curricular, the behavioural change of learners towards the environment shall increase significantly. Infusing EE themes could be traced in subjects like Life Sciences, Languages, Agricultural Sciences, Arts, Geography, Mathematics and Mathematical Literacy at the FET phase in South African schools.

1.3 STATEMENT OF THE PROBLEM

The South African Constitution (1996) provides for co-operative government and the government White paper on environmental management policy places human beings as a central part of the environment (CSIR, 2004). As a result of this legal mandate, post-apartheid South African education has incorporated various environmental education themes in the school curriculum.

Evidence of research in two primary schools in Mpumalanga reveals that teachers do have varied views and understandings regarding the integration of environmental education in the school curriculum (Mokhele, 2011). According to Kiarie (2016), teacher perception on environmental education plays a pivotal role on how learners acquire environmental knowledge, thinking and attitude towards a sustainable environment.

The newly revised Curriculum and Assessment Policy Statement (CAPS) has done justice to environmental learning by integrating environmental themes in all subject areas in the Further Education and Training phase (DoE, 2011). Examples are Mathematics, Mathematical Literacy, Economics, Business Studies, Languages, History, Life Sciences, Physical Sciences and Tourism.

However, there is no clear-cut policy guideline regarding the implementation EE in the curriculum. For instance, the DoE (2011) document for Mathematics at the FET level urges all teachers to incorporate environmental issues into lesson delivery whenever it is suitable to do so. In addition to this, mechanical technology, as stated in the DoE (2011), aims to produce and develop the engineering and manufacturing industry to enhance the quality of life of the citizenry by safeguarding sustainable use of natural resources and the environment. It is regrettable to know that in the above-mentioned subject content, there is not even a single topic linked to EE in the Grade 12 curriculum. Life sciences, which is perceived to be EE biased, cannot proud itself with any EE topic in the Grade 12 curriculum.

An EE integrated approach, as propounded by the DoE (2011), seems to be a mirage mostly in the Grade 12 curriculum because much is not done in terms of content to equip Grade 12 learners who are the end product of the twelve years of South African basic education curriculum. It is of great interest to know that, there is no policy guideline used by teachers in the integration of EE.

The researcher is a Mathematics specialist, who has taught Grade 12 learners over a decade. The pressure of meeting the demands of the curriculum in Grade 12 makes it quite challenging for teachers to devise their own strategies of incorporating EE into their subjects (DoE, 2011:5). The stress of completing the syllabus and preparation of Grade 12s for final examinations makes teachers to neglect EE integration in their subjects. EE is, therefore, marginalised and downplayed in the Grade 12 curriculum. The future of South African society and the environment is compromised if Grade 12s are not well informed about environmental issues. Grade 12 is the final year and transitional period from the FET phase to workplace and further studies (DoE, 2011:4).

There is a need for all Grade 12 learners to acquire moderate environmental knowledge in order to shape their thinking and approach on environmental issues. The awareness of EE not being given the needed attention, as an integrated component in the Grade 12 curriculum, is the motivation for this study. This study thus unravelled teachers' beliefs about EE integration into their field of interest in the Grade 12 curriculum. In addition, the study has not come across any research study conducted at the FET level addressing perceptions of teachers on the integration of EE into the curriculum since its inception in South Africa.

1.4 The purpose of the Study

The purpose of this study was to determine the perception of teachers regarding EE integration, in all subjects in the South African school curriculum. The study examined methods adopted by teachers to Integrate EE and studied challenges faced by teachers in the integration of EE in their subject areas of speciality. Policy suggests there should be an integrated approach of EE across curricular, but there are no guidelines for its implementation. It is the belief of the researcher that if EE is effectively integrated into other subjects at the FET phase, specifically in the Grade 12 curriculum, it shall help to raise responsible citizens who are well endowed with requisite EE knowledge and skills to preserve and conserve the natural resources for today's world and generations to come. Therefore, the purpose of the study uncovers teachers' perception regarding the implementation of the policy document on EE in the South African education system

1.5 SIGNIFICANCE OF THE STUDY

In an era of global call for action against environmental degradation and the integration of EE in the school curriculum, it is imperative to know the extent at which EE had been integrated into FET subjects. The success of EE implementation, as an integrated component, largely depends on the perceptions of teachers, which indirectly influence learner perception on the environment. This study has highlighted lapses in EE as an integrated component in the Grade 12 curriculum.

The study intends to contribute to the national curriculum development in South Africa in the integration of EE to various subjects in the school curriculum. It identifies gaps in the curriculum process, planning and designing regarding integration of EE into other subjects in Grade 12. The study further ascertained views of subject teachers on EE as an integrated component. This shall certainly be helpful to curriculum developers in the review of the curriculum. Challenges faced by educators shall be known, and this will be significant to the Department of Basic Education in curriculum design, development, implementation and assessment.

Successful integration and implementation of EE in the school curriculum may lead to preservation of scarce natural resources and help sustain the global call for Education of learners as responsible indigenes.

1.6 DELIMITATIONS/SCOPE OF THE STUDY

The researcher confined this study within Further Education and Training curriculum in the Grade 12 curriculum EE integration, as embedded in the newly revised policy document: Curriculum and Assessment Policy Statement (DoE, 2011). The study was confined to the Grade 12 curriculum because it is the final phase of training responsible citizens so that they can transfer integrated EE knowledge into their career paths. The study focused on the perception of various subject teachers regarding the integration of EE themes into their respective subjects. Geographically, the study is limited to three high schools within the East London Education District, Eastern Cape Province.

1.7 RESEARCH QUESTIONS

1.7.1 Main Research Question

What are teachers' perceptions of the integration of environmental education into the Grade 12 curriculum?

1.7.2 Sub-Research Questions

i. What are teachers' awareness of EE integration in the school curriculum?
ii. What are teachers' understandings of EE integration in the school curriculum?
iii. How should teachers integrate EE into their respective subject area?
iv. What is the importance of EE integration into the Grade 12 curriculum?
v. What challenges do teachers face in the integration of EE into the Grade 12 curriculum?

1.8 OBJECTIVES OF THE STUDY

i. To ascertain the awareness of teachers regarding the integration of EE into their respective subject areas.
ii. To establish teachers' understanding of EE integration into the Grade 12 curriculum.
iii. To ascertain the delivery method used to implement and integrate EE into respective subjects.
iv. To determine the importance of EE integration in the school curriculum.
v. To identify challenges and limitations teachers face in integrating EE into their subjects

1.9 Definition of key terms

The key terms in this study are: *environmental education, integration, perception, curriculum, Grade 12.*

1.9.1 Environmental Education

According to Davidson-Hatzenbihler (2018), EE is the holistic process of learning which improves knowledge and deeper understanding of the environment; the intention is to make students more responsible through active participation in the protection of the environment.

Davidson-Hatzenbihler (2018) stated that the elements of environmental education include:

- **Awareness and sensitivity** to the environment and environmental challenges;
- **Knowledge and understanding** of the environment and environmental challenges;
- **Attitudes** of concern for the environment and motivation to improve or maintain environmental quality;
- **Skills** to identify and help resolve environmental challenges; and
- **Participation** in activities that lead to the resolution of environmental challenges.

Environmental education teaches individuals to be environmentally literate, and this enhances their problem-solving skills. The skills make them to be responsible citizens.

1.9.3 Integration

The Oxford English Dictionary defines *integration* as a process of combining "one thing with another to form a whole". According to Adu, Adesegun and Adekunle (2016), integration is the process of infusing two or more things collectively. Adu et al. (2006) further argued that integration, as an approach in learning, helps in the holistic development of learners. Goussia-Rizou and Abeliotis (2017) indicated that an active approach of creating environmental awareness through teaching at secondary school is by integrating EE across-curricular.

For the purpose of this study, Integration of EE is the process of incorporating the various environmental themes into various subjects at all levels. This shall provide the needed skills, values, attitude and knowledge to the populace in ensuring active participation in dealing with environmental issues and finding solutions to problems confronted by humanity (UNESCO, 1977).

1.9.4 Curriculum

Curriculum can be defined as the “offering of socially valued knowledge, skills and attitudes made available to students through a variety of arrangements during the time they are at school” (Adu and Ngibe, 2014:983).

In simple terms, *curriculum* is the strategic layout of learning processes that encompasses all learning outcome. For the purpose of this study, curriculum can simply be understood as the National policy, which guides the integration EE across-curricular as embedded in CAPS document.

1.9.4 Perception

According to the Oxford English Dictionary, *perception* can be explained as “the way in which something is regarded, understood or interpreted. In the context of this study, perception is the understanding and views of teachers regarding EE integration in the school curriculum.

1.9.5 Grade 12

Grade 12 is the final stream in the FET band of the Basic Education curriculum in the South African education system. The phase prepares learners for tertiary education.

1.10 RESEARCH METHODOLOGY

Methodology is the procedure adopted in a research study (Creswell, 2017). In this study, the researcher investigated teacher perceptions on the integration of EE into the Grade 12 curriculum. This chapter discusses the methodological framework of the study, research paradigm, research approach, research design, sample and sampling techniques, data collection instruments, data analysis and data trustworthiness. These strategies assisted the researcher in carrying out this investigation in a scholarly manner.

1.10.1 Research paradigm

According to Guba as cited in Creswell et al., (2017), a paradigm refers to fundamental principles that guide the study. Cohen, Manion and Morrison (2013) argued that a paradigm is the inspiration for conducting a study.

The Interpretivist paradigm

The study adopted an interpretivism paradigm. Creswell and Poth (2017) argue that in this paradigm, the researcher seeks the understanding of respondents' lived experiences. The aim of the researcher adopting this paradigm is to depend on the participants' views of the situation in the study. Mack (2010) explains that the goal of the interpretivism paradigm is to analyse the study objectively from within through direct experience of the participants.

The researcher carried out this study to extract views and perceptions of subject teachers regarding the integration of EE into all subjects in the FET curriculum.

1.10.2 Research approach

Research approaches are well-structured processes of a study that run through data collection and interpretation of data (Creswell, 2013). This study adopted a qualitative approach.

Qualitative approach

Qualitative research examines data from direct fieldwork, through in-depth analyses, open-ended interviews and written documents.Patton (2005) states that in this approach, researchers conduct the study in the natural setting of the respondents.

According to Creswell (2013), a qualitative approach is an approach for exploring and understanding the meaning individuals or groups ascribe to a social or human problem. Data is typically collected in the participants' setting, and data analysis inductively builds from particular to general themes, and the researcher makes interpretations of the meaning of data. The researcher turns the world into series of representations, including field notes, interviews, conversations, photography, recordings and memos. In this research approach, the researcher carries out the investigation in natural settings.

The study used this approach because it helped to understand and critically examine how different teachers implement the integration of EE into their lesson delivery. Qualitative approach is considered the most appropriate for this study because the study sought perceptions of teachers on how EE is integrated (Palmer, 1998).

1.10.3 Research design

A research design is "the procedure for conducting the study, including when, from whom and under what conditions the data will be obtained". It specifies the method used for data collection (McMillan & Schumacher, 2010:20). The significance of research design is to give a direction on how to find evidence that addresses the research questions. Mouton (2008) stated that the research design is the layout of the study. According to Yin (1984) research design is the chronological flow that links data to the research questions and the study's conclusion.

The researcher has chosen the phenomenological method as the research design appropriate for the proposed study. The choice of this design is mainly based on what the researcher sought to investigate: teachers' perceptions on EE themes integration across-curricular. The study focused on the input of the respondents to the research questions. What teachers said about EE was evidence of how they perceive environmental education (Kimaryo, 2011).

Phenomenological method

Creswell (2013) defines phenomenology design as an inquiry from philosophical and psychology in which the researcher describes the lived experiences of individuals about a phenomenon as described by participants. Giorgi (as cited in Kimaryo, 2011) states that, phenomenological design provides an in-depth understanding of human conduct. Phenomenological design, according to Flowers, Larkin and Smith (2009), is a philosophical interpretative qualitative research design examining personal experiences, as perceived by the respondents.

Phenomenological design "describes the meanings of a lived of experience". The main objective of this design is to "transform lived experience into a descriptive essence allowing for reflection and analysis" (McMillan et al., 2010:24). The argument went further to state that the purpose of phenomenological design is to

describe and interpret the experiences of respondents in relation to a specific event to understand the respondent's meanings attached to that particular event.

Schreiber and Kimberly (2011) state that phenomenology is an approach of research that concerns the study of the respondents' immediate lived experiences. In addition, the approach focuses on the essence of phenomena. Phenomenological design can be explained as a study that investigates the essence of the experience as perceived by the respondents. This design sought clarity and understanding of participants' perceptions and experiences ascribed to a specific event.

In pursuit of answers to the main research question and sub-questions, the study adopted the phenomenological design. This study sought to find out teachers' perception on integration of EE across-curricular at the Further Education and Training (FET) phase; therefore, phenomenological design was the appropriate method used.

1.10.4 Sample and sampling techniques

Sample is defined as a group of respondents or participants from whom data of the study shall be collected. The study was conducted in one public high school in Grade 12 in East London Education District, Eastern Cape Province. This study examined six (6) Grade 12 teachers' perceptions of the integration of environmental education across curricular and how they integrate EE into their lesson delivery. In this qualitative interpretative research study, respondents were carefully selected for the purpose of the study to achieve the expected results (Maykut & Morehouse, 2004).

Sampling technique: Purposive Sampling

Based on the aim of the research, the study adopted a purposeful/ purposive sampling technique. According McMillan et al. (2010), purposeful sampling is a technique whereby the researcher selects specific elements of the population that will be useful in the collection of data and a representative of the study of interest. In this study, the researcher selected six (6) Grade 12 teachers from one public high school teaching different subjects.

1.10.5 Data Collection Instrument

The choice of data analysis technique is as important as other components of the research design (Schreiber et al., 2011). The process of obtaining data for this study depended on the respondents. The researcher wrote formally to the East London Education District Office to seek for permission to conduct the study in a public school. The researcher then visited the identified schools with the introductory or permission letter from the district office and then familiarised himself with the school authorities and the staff members. Selected respondents were duly informed about the intentions of the study to be conducted.

Subsequently, the researcher commenced the process of data collection. In this qualitative study, the researcher used in-depth interviews as a tool in the collection of data. McMillan et al. (2010) described in-depth interviews as the process of using open response questions to seek information from the respondent; it is an extensive, long, probing technique.

Johnson and Turner (2003) and Smith et al. (2009) indicated that in-depth interviews help the researcher to probe further to bring clarity on the study. The study sought to find out teachers' perceptions on EE integration across-curricular. It is, therefore, imperative for the researcher to engage the respondents in a more detailed interview to collect credible data. Therefore, the choice of in-depth interviews was relevant for the study.

In view of in-depth interviews, the researcher adopted interview guide approach. Johnson et al. (2003) describes this approach as where the topic for the interview is pre-specified and listed on an interview protocol. However, the researcher is not restricted to follow the questioning sequentially, and the wording can be re-framed to cover more information for the study. The researcher conducted the interviews in a coherent atmosphere, and interview questions were rephrased to ascertain credible data from respondents. Questions were redirected to probe further on respondents' understanding, views and beliefs of EE integration into their respective subject areas.

1.10.6 Data analysis

The data for this qualitative study was collected through in-depth interviews. Inductive analysis was adopted to analyse the data. Inductive analysis is the process through which researchers create meaning out of data collected through specific guidelines. In addition, the process of analysing with an inductive style is a more "systematic process of coding, categorising, and interpreting data to provide explanations of a single phenomenon of interest" (McMillan et al., 2010:367)

The process of analysing the data was a systematic process. Firstly, interviews were conducted and then transcribed to produce data for analysis. Kvale (1996) argued that transcription relates to converting oral speech to written text. The procedure for transcribing the data was done manually to capture views expressed by the respondents to make data more credible and reliable according to themes that emanate from the data collected.

1.10.7 Trustworthiness

To enhance data trustworthiness, the researcher adopted three distinctive strategies, namely, member checking, prolonged and persistent fieldwork and mechanically recorded data.

1.11 ETHICAL CONSIDERATIONS

According to Lichtman (2013), ethics of research simply mean taking precautionary measures to guide respondents from any harm. Any credible and scientific study should adhere to research ethics. It is further argued that, ethics is acting morally proper or improper when engaging participants (McMillan & Schumacher, 2010). Dealing with respondents at the field has many serious moral and professional implications.

However, the success of this study largely depended on the respondents' lived experiences. The instrument for data is mainly in-depth interviews with the respondents. There are many who get irritated when questioned persistently, whereas others may gladly answer any question from the researcher. This brings to the fore the notion of individual differences as respondents need to be safeguarded to avoid any physical or psychological harm whatsoever.

The study was conducted in one public high school with the approval Department of Education, East London Education District and the consent of the school principal and school management Team (SMT). In view of these ethical concerns, the study adhered to the following code of ethics to protect the respondents for this study:

1.11.1 Informed Consent

Respondents or participants in any scientific study are entitled to information about the study. The burden of making respondents aware and well informed about the study lies on the researcher (Lichtman, 2013).

Although the researcher cannot describe the direction of the study at the field, it is the researcher's responsibility to ensure that all respondents do understand their role and participation in the study.

In light of this, the researcher of this study made conscious effort to inform all participants about the nature of the study by giving out informed consent forms to all respondents. The contents of the form were well interpreted and explained to all respondents for them to make informed decisions on whether to participate or not. Willingness of participation was indicated by respondents' signature on the informed consent form.

1.11.2 Confidentiality and Anonymity

An individual participating in a research study should have adequate security and privacy guarantees from the researcher (Lichtman, 2013). For the purpose of this study, the research took adequate steps to ensure that there is no breach of privacy throughout the study.

The researcher removed all identifiable information from the records of the study. Permission was sought from respondents to disclose certain findings to the public. In addition to this, the researcher was sensitive to any information received from the respondents in the field, all data collected were treated as confidential. The researcher maintained anonymity through the study.

1.11.3 Voluntary Participation

Respondents' involvement in a research study should be done at their own volition. Offering money for research participation shall compromise the voluntariness of their informed consent as any undue influence shall distort the judgement of potential respondents (Grady, 2001).

The researcher duly informed all respondents about their rights of participation in this study. Respondents were not forced to participate in this study, and admission was done voluntarily without any form of coercion. Respondents reserved the right to pull out at any stage of the study.

1.12 CONCLUSION

This chapter provided the background of the study, significance, statement of the problem, research questions, research objectives, delimitation of the study (scope) operation definition of terms, methodology and ethical considerations of the study

1.13 Chapter Outline

This study consists of five chapters as follows:

Chapter One

This chapter gives the background, overview, scope, delimitation, a problem statement, research questions, and objectives, purpose of the study, significance and definition of key terms of the study.

Chapter Two

The chapter discusses and provides the theoretical framework and literature review for the study.

Chapter three

This chapter provides the methodology used to carry out the research and the data collection techniques.

Chapter Four

This chapter provides detailed discussion on findings and presentation of analysis of the study.

Chapter Five

This chapter provides a summary of recommendations and conclusions of the study.

CHAPTER TWO

THEORETICAL FRAMEWORK AND LITERATURE REVIEW

2.0 Introduction

The previous chapter provided the background of the study, significance, statement of the problem, research questions, research objectives, delimitation of the study (scope), operation definition of terms, methodology and ethical considerations of the study. This chapter is called *theoretical framework* and *Literature review*, literature review is the process of collecting and analysing related topics on a research study. The essence of the review is to explore what other scholars are saying about the integration of EE across curricular. The study analysed journal articles, books and other sources relevant to the study. These headings were scrutinised in detail: integration of EE in South African schools, methods delivery the content of EE, educator's awareness of EE, Challenges faced by teachers in the integration of EE into their respective subject areas.

The researcher also reviewed journal articles, research studies and books on the theoretical framework of opportunity to learn (OTL) which formed the framework of the study and examined theme-based model of curriculum integration, teacher's perception regarding the integration of EE into their respective subjects.

2.1 THEORETICAL FRAMEWORK

This study is based on the theoretical framework of Opportunity to Learn (OTL). International Association formulated the concept of OTL for Evaluation of Educational Achievements (McDonnell, 1995). OTL is defined as the multiplicity of factors that create conditions for teaching and learning, such as curricula, learning materials, facilities, teachers and instructional experiences (Scherff & Piazza, 2005). One researcher indicated, "OTL is about providing institutional resources and identifying institutional conditions and practices for all learners to achieve the standards and goals set by each of these institutions" (Mokhele, 2011:79).

According to Banicky (2000), opportunity to learn (OTL) was originally defined as the overlay between the concept acquired by learners and what they are assessed on. It was further argued that the OTL definition has gone beyond mere acquisition of knowledge and assessment of learners; it has been extended to cover a wide range

of elements that affect teaching and learning. These include teachers' and learners' experiences, teacher development, curriculum, quality of resources at school, all intended to give learners equal opportunity to learn effectively.

Concisely, OTL can be explained as measures implemented by the education system to assist learners to achieve the anticipated learning objectives set by the content areas and assessment standards. Many studies have shown that learners learn effectively when given an opportunity.

There are many disparities in the education system in South Africa regarding the integration of EE across curricula, mainly teachers' perception of EE as an integrated component into their respective subjects. This affects teachers' lesson delivery and does not give learners the opportunity to grasp integrated EE themes embedded in the school curriculum.

In this study, the researcher examined variables like teachers' perceptions regarding the integration of EE in the FET curriculum. In addition, the study explored how subject teachers of Life Sciences, Physical Sciences, Mathematics and languages incorporate EE into their subject areas to achieve the anticipated outcomes prescribed by the national policy (DOE, 2011).

The below table illustrates some variables associated with OTL:

Table 2.1 Factors Associated with OTL

Curriculum	**Instructional Quality**	**Time**	**Resources**	**School Conditions**
Aligned with content standards Integrated across content areas Relevant to	Teaching experience Teacher Certification Teacher turnover	For lesson planning and collaboration For uninterrupted periods of instruction	Adequate physical space Access to textbooks, technology and support materials	Instructional leadership on the part of administration Policies promoting collegiality of school staff

students and reflecting real life problems Aligned with assessments for monitoring student progress	Teacher attendance Teacher commitment Use of appropriate and varied teaching strategies		School and community partnerships designed to address student health and social service needs Parental Involvement Quality Professional Development Equitable finance formulas within and between schools/district	High expectations for student learning Student attendance incentives Safe and orderly learning environment Teacher involvement in decision making

Modified from Education Policy Brief (Banicky, 2000:3).

The study employs factors of integration of EE across curriculum and teachers' perceptions regarding the integration of EE into their respective subject areas. All these are variables influencing OTL (Banicky, 2000). In the South African context, EE themes are integrated across curricular, and the teaching of EE is a collective responsibility for all teachers (DoE, 2011). It is important to ascertain teachers' views, understanding with respect to the integrated curriculum. Teachers' perceptions negatively or positively affect their lesson delivery and impede opportunities for learners to acquire EE knowledge and skills. The researcher examined teachers'

views and understanding of EE integration to give all learners equal opportunity in learning EE.

Lotz-Sisitka (2012) examined the state of EE in the South African curriculum, namely, the Outcomes Based Education (OBE) and the curriculum 2005. The post-apartheid curriculum came to amend the gap in the system. According to Lotz-Sisitka (2012), the government of South Africa integrated EE into the formal education system through curriculum 2005.

Lotz-Sisitka (2012) revealed the effect of EE on the South African education system. The research examined the impact of EE in two school in the Lusikisiki education district at Eastern Cape. The intent of the study was to help teachers to implement the integration of EE into their respective subject areas, in the school curriculum. According to Lotz-Sisitka (2012), many teachers have no formal training on the integration of EE and its implementation. Therefore, the study aimed to assist teachers to acquire enough knowledge to redress the gap in teacher development of EE. Lotz-Sisitka (2012), in the study, employed a qualitative research approach by using interviews and observations

The literature review in the above-mentioned study, examined journals and policy documents on national education policies, including curriculum 2005 and OBE. The study also analysed documents from neighbouring countries like Botswana and the Tbilisi declaration report from global perspective. The study investigated what subject teachers could do to implement the integration EE into their subjects in their lesson.

Lotz-Sisitka (2012) also used a case study method approach to sample two schools from Lusikisiki education district from both private and public school. The study interviewed twelve teachers from the two selected schools, parents and Department of Education officers. The data collected through this study brought to light the existing lapses in the South African system of education on EE integration.

Lotz-Sisitka (2012), revealed that:
(a) Many teachers in the classroom are not well qualified to integrate EE;
(b) Many teachers in the classroom were not well informed about the existence of EE in the school curriculum. The level of understanding of the concept of EE integration by teachers was disproportionate. Many teachers faulted the Department of Basic

Education for not giving them support in pursuance of the dynamisms in the national curriculum; and

(c) Most learners who were interviewed in the study lacked basic knowledge about the environment.

Lotz-Sisitka (2012) recommended that: there should be professional development for all teachers on EE integration; the Department of Education should assist schools to develop their internal polices to integrate EE; and the Department of Education should equip teachers and learners with the relevant teaching and learning materials. The study concluded that EE is marginalised in the the school curriculum and CAPS (2011) has not changed the *modus operandi*. In view of the data collected and analysis made, the researcher opted for an independent EE in the school curriculum.

Post-apartheid curriculum has seen several changes leading to the introduction of newly revised Curriculum and Assessment Policy Statement (CAPS) in January 2012. According to Adu (2014), the revised curriculum seeks to amend the lapses and gaps in the old curriculum. The curriculum derives its source of inspiration from Act 108, of 1996 Constitution of the Republic of South Africa (DoE, 2011). The preamble of the constitution aims at ensuring and improving upon the quality of life of the citizenry (Constitution of South Africa, 1996).

One of the aims of the South African Curriculum (2011) is to produce learners that are able to "use science and technology effectively and show responsibility towards the environment" (DoE, 2011:5). In achieving this goal, the South African education system has integrated EE in the school–based curriculum. This may not only help learners to acquire knowledge but rather produce citizens who are environmentally literate and responsible in preserving the environment.

The main objective of a school curriculum of every nation is to "create ideal citizens" who are nationalistic and patriotic and an embodiment of the nation's objectives. Therefore, integration of EE into the school curriculum will produce students who are empowered to develop environmental values and attitudes to benefit the society and generations to come (Parker, 2017:1250).

The newly revised CAPS (2011) has Integrated EE themes into subjects in both General Education and Training (GET) and Further Education and Training (FET) phases in the curriculum. However, the researcher examined EE integration specifically in Grade 12 curriculum, which is the final Grade for the FET phase. The

diagram below shows how EE is integrated into subjects like Life Sciences, Physical Sciences, Mathematics, Mathematical Literacy, Life Orientation, Economics and Languages at the FET phase.

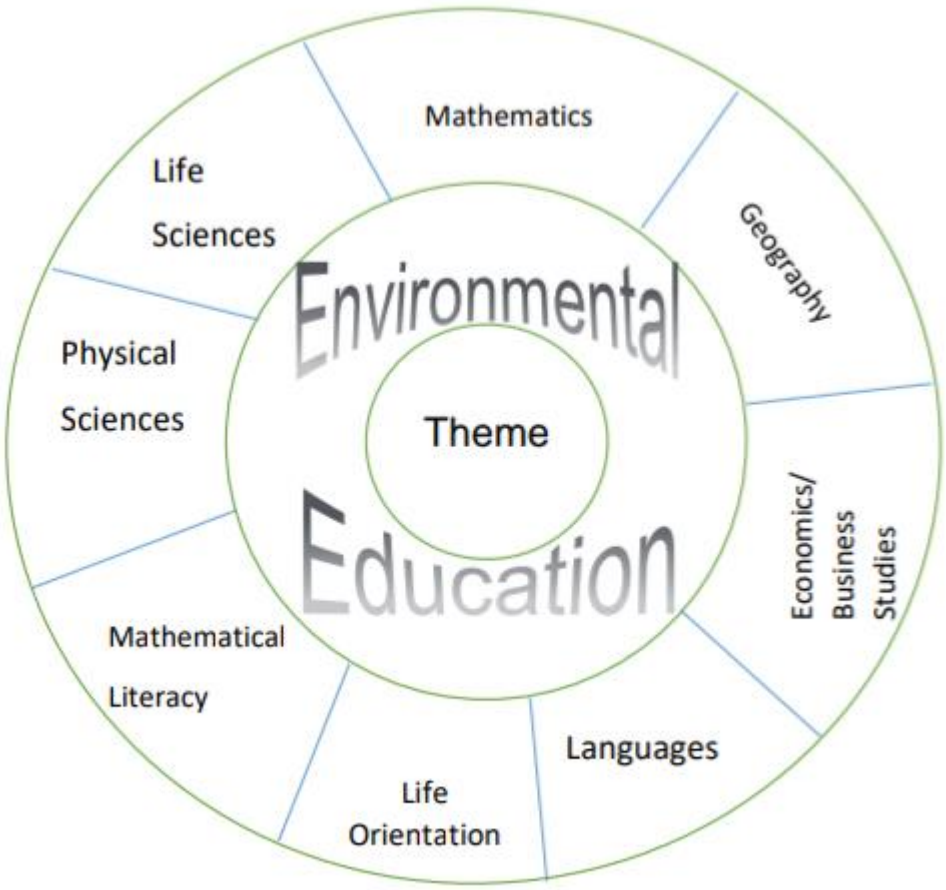


Figure 2.2 Modified from du Toit and Oliver (as cited in Mokhele 2007:19)

According to Mokhele (2007), the recommended approach to teaching and learning of EE in most countries, including the South African curriculum, is the integration of EE themes into other subject areas. However, its implementation is quite challenging due to varied views, understanding, knowledge and perception of subject teachers. The table below shows how EE content areas are integrated into some subjects in the CAPS document for the Grade 12 curriculum in the South African context.

Table 2.3 EE integrated themes into some Subjects at the FET phase- Grade 12 Curriculum

Subject(s)	EE integrated themes
Mathematics Mathematical Literacy Technical Mathematics	1. Interpreting statistics on environmental trends and developments 2. Developing basic mathematical skills through case study work on the local environment. 3. Understanding, estimating and calculating probabilities using contemporary environmental data. 4. Calculating distances, length and angles using the natural and build environments
Life Orientation	1. Social and environmental responsibility. Impact of degradation on society and the environment: environmental hazards such as soil erosion, pollution, radiation, floods, fires etc.
Life Sciences	1.Responding to be environment (humans) 2. Responding to the Environment (plants). 3. Human impact on the environment: current crises
Physical Sciences	1. Organic Molecules * Organic molecules as molecules containing carbon atoms. *carbon as the basic building block of organic compounds that recycles through the earth's air, water, so Soil, and living organisms including human beings. 2. Conservation of energy with non-conservative forces present. 3. Electrical machines (generators, motors), Photoelectric effect, Link to the harnessing of solar energy
Economics	1.Globalisation 2. Environmental deterioration 3.Environmental sustainability
Business Studies	1. Human rights, inclusivity and environ-mental issues.

	The extent to which a business venture addresses issues such as human rights, inclusivity and environmental issues
Languages	Stories, novels, plays and poems from around the world on environmental themes. • Drama and role-play to elucidate attitudes and perspectives on environmental issues. • Comprehension, creative writing and discussion around environmental topics to develop reflective and language skills. • Media studies programmes based around environmental films
Geography	Geographical skills and techniques: topographic maps, GIS, synoptic weather maps 1. Climate and weather: cyclones, local climate 2. Geomorphology: drainage systems and fluvial processes 3. Rural and urban settlement 4. Economic geography of South Africa:

Adapted from CAPS (2011), document.

From Table 3, it can be seen how EE themes has been integrated into the afore-mentioned subjects in the Grade 12 curriculum. It is interesting to know that in the subjects listed above, EE themes constitute main content areas of that specific subject. The mode and extent of EE integrated content differs from one subject to another (kimaryo, 2011).

In the South African curriculum, the only subject that is environmentally biased is Geography, which is an elective subject for learners at the FET phase from Grade 10-12 (DoE, 2011). There are only four chapters in the Grade 12 Geography curriculum, and all the topics are purely environmentally based.

2.2 ENVIRONMENTAL EDUCATION AS A COMPONENT OF THE SCHOOL CURRICULUM

According to Palmer (1998), EE in the school curriculum can be defined as total experience, skills, values, attitude and knowledge required to raise learners who are environmentally literate to make decisions, solve problems and initiate measures towards the conservation of the environment.

Kimaryo (2011) indicated that the planning of an integrated EE curriculum should, in its totality, encompass the goals, skills, knowledge required of learners and what is expected of teachers and learners in the integrated curriculum. The call for integrating EE into school curriculum emanated from the UNCED (1992), where an inter-governmental conference saw the need to find a solution to global environmental issues confronting every country. Kimaryo (2011) further stated that, the incorporation of EE into the school curriculum is needed to create environmental awareness and raise learners who are environmentally literate and responsible. It is therefore, important to have a curriculum to develop learners on environmental issues and protection of the ecosystem.

The integrated approach is one of the ways of incorporating EE content areas into all school subjects across curricular. Jackson (2010) and Klein (2011) recognise the integrated approach as a multidisciplinary approach, where EE content takes centre stage of other subjects. Other schools of thought also classified it as a whole school approach to EE.

The idea of integration, in this context, denotes the fusion of EE themes into content areas of other subjects in the school curriculum. According to Drake (2014), the common approach to include EE in the school curriculum is the integrated approach. This approach is recommended by many stakeholders because various environmental issues can be addressed across others subject in the school curriculum.

With the integrated approach, EE is not a stand-alone subject, but its contents are embedded into content areas of other subjects; therefore, EE does not add up to the number of subjects in the school curriculum. It also does not replace the content of other subjects, but rather incorporates holistically throughout the subject areas (Tilbury, 2005).

Effective integration of EE into the school curriculum largely depends on the design, aims and objectives of a national school curriculum of a specific country. It is further stated that, successful integration of EE into existing subjects may help learners to acquire the needed environmental skills, attitude, knowledge and understanding collectively for learners to be environmentally literate.

Environmental literacy creates awareness of environmental issues, and these help learners to be more active and responsible toward the conservation and protection of the environment. Bolstad (2005) argued that, the ideal of integration is achievable because schools and curriculum developers can find gaps within existing school subjects to link up with various environmental themes instead of making EE a stand-alone subject.

To address environmental issues, there is a need for collective effort and action. It is, therefore, imperative to have EE integrated into all school subjects; hence, the integrated approach, sometimes referred to as whole school approach. It is further argued that, environmental issues should be addressed holistically through an interdisciplinary context in order not to leave any child behind (Kimaryo, 2011).

According to Kimaryo (2011), the notion behind EE integration is to draw inspiration from different subject areas, which facilitates the exchange of ideas from different subjects and teachers. This is supported by Palmer's (1998) argument that the implementation of EE through the integrated approach shall close the gap in the system between rhetoric and practicality of environmental issues and EE.

Rusinko (2010) argued that the integrated approach is an effective approach to incorporate EE into school subjects. However, it requires a lot of time, resources and teachers' experiences. Kimaryo (2011) affirmed that the Tanzanian education system has effectively integrated EE into all primary school subjects. The author added that EE is taught in all subjects to equip learners with the necessary skills and attitude towards the environment.

Apart from the inclusion of EE in other subjects, EE has also taken centre stage in in extra-curricular activities, which include cleaning of school premises, management of school gardens, planting of trees and recycling of waste. The extra-curricular activities further heighten the understanding of environmental issues and changes the misconceptions learners have toward the environment (Kimaryo, 2011). Many countries, globally, have joined hands together in dealing with environmental issues.

According to Ofwono-Orecho (1998), Adebayo and Olawepo (1997), Hua (2004), Finnish National Board of Education (2004) Flaws and Meredith (2007), Uganda, Nigeria, China, New Zealand and Finland have adopted the integrated approach to EE. The integrative approach calls for the incorporation of environmental themes across-curricular.

All the afore-mentioned countries seek to educate the populace on environmental issues through a formal education system. In raising responsible citizenship, the curriculum intents to create environmental awareness among learners and instil the notion of conservation of the environment from further degradation. In certain countries, EE is fully integrated into learning areas such Geography, Biology, Social Studies, Natural Sciences and Physical Sciences in the school curriculum (Jeronen & Jeronen, 2008).

According to Palmer (1998), growing environmental degradation, desertification, pollution, depletion of ozone layers and global warming require pragmatic steps to mitigate these. There is a need for global action in making citizenry aware of environmental issues. Palmer further argued that the promotion and development of EE should be a global agenda. It is within the spirit of this assertion that the South Africa curriculum is well-integrated to accommodate EE themes in all subjects and phases of education.

Abid and Holt (2003) indicated that EE is critical for promoting sustainable development to create environmentally literate citizenry and equally equip people to address environmental issues confronting societies which include, poverty, degradation, water and air pollution. These problems endanger human life (European Commission, 2013). Therefore, the sustainability of the environment and its ecosystems largely depends on effective teaching and learning through a formal education system that gives equal opportunities to all learners to acquire moderate EE knowledge.

2.3 TEACHERS' AWARENESS OF EE

The current state of a global environment is confronted with many factors that are destroying the environment. What drives environmentalists to fight for a heathy world is the passion of maintaining the environment for generations to come. We should not pass on the current global state of the environment problems to the unborn generation. It is, therefore, imperative for everyone to spread environmental

awareness. Before anyone can champion the course of promoting environmental awareness, it is imperative for the one preaching the message to have in-depth understanding of environmental problems (Pachamama Alliance, 2018). For teachers to have the confidence of integrating EE into their subjects, they should be well informed of environmental issues and be updated about current environmental issues.

2.3.1 Environmental Education and Economic Growth

Wasmer (2005) stated that the Chinese economy is growing fast, with a huge impact on the environment. The Brundland report (1987), according to Wasmer, highlights the need for environmental sustainability and conserving the environment for generations unborn. This has necessitated the need for the Chinese government to take measures towards the sustainability of the environment. According to Wasmer (2015), in 1992, the Chinese government focused on pollution and protection of the environment. The government enacted laws aimed at keeping the trend of economic growth without degrading the environment. Economic development has serious implications on the environment if there are no measures to check the activities of the economic sector.

2.3.2 Environmental awareness in China

Wasmer (2005) argued that in order to create environmental awareness among the populace and in schools, the government should incorporate EE into secondary schools' curriculum by adopting a policy called Action Compendium on Environmental Propaganda and Education (1996 – 2010). This policy was a step in the right direction towards the fight against environmental degradation.

According to Wasmer (2005), the goals that motivated this policy were: to change the views and perception of people towards the environment, to educate people to be more concerned about environmental protection, to liaise with schools regarding integration of EE into the whole school system. Wasmer (2005) argued that the ideal of incorporating EE into the Chinese formal education came to fruition between 1988 and 1990. Within this period, the State Education Commission (SEC), made a recommendation for the integration of EE into senior secondary schools' curriculum where EE became an optional subject for learners.

According to Wasmer (2005), in pursuance of the 1990 recommendations, in 1993, EE formally incorporated EE themes into social and economic studies content areas. This brought a new dawn into the Chinese education system that focused on socio-economic transformation environmental protection and educational reform. The research study revealed that China has responded to the global call for EE integration into formal education by improving incorporation environmental themes in the formal school curriculum. These aimed at increasing environmental awareness and raising citizens who are environmentally literate and responsible for the conservation of natural resources.

Environmental awareness emanates from environmentalism ideology. It is the act of taking responsibility of protecting and preserving nature against human destruction. Therefore, environmental awareness is to understand issues affecting the environment and the importance of its preservation (Pachamama Alliance, 2018). According to Ullah et al. (2013), environmental awareness can be explained as having sufficient knowledge about the environment. It is further argued that the most effective way to raise people who are environmentally literate is through EE. Promotion of EE enhances awareness of environmental issues and change of behaviour and attitude towards the environment. An individual who is into environmental issues can be classified as naturalistic. The naturalistic intelligence of a teacher refers to how much the person likes outdoor activities, admiring nature at leisure hours and enjoying documentaries about nature (Gafoor & Munavvir, 2012).

According to a study conducted in India, with a sample of 300 teachers (136 males and 164 female), it was revealed that a considerable number of teachers has moderate levels of EE awareness. The researcher argued that gender, age and school play a huge role in EE awareness. It was discovered that the majority of female teachers are more familiar with EE compared to male teachers. The study further stated that teachers ranging from the ages of 31-50 years had high levels of awareness of EE, and teachers at private schools had extreme level of awareness of EE, compared to their counterparts in the public schools (Larijiani, 2017).

Environmental awareness can be categorised into two parts, namely, perception of people on environmental issues and behavioural issues toward the environment. Environmental perception relates to views, knowledge and understanding of people

about the environment. The behavioural aspect can be measured on the importance people attach to environmental protection and their mind-set regarding the preservation and conservation of the environment (Auwalu, 2015:135). A study conducted in Malaysia revealed that an individual's level of awareness determines the height of their perceptions. Furthermore, there is a strong positive correlation between awareness and attitude towards the environment.

The level of awareness of society is crucial to work together to save the planet. Environmental awareness helps to raise responsible citizenship, attitudes, values and skills needed to solve environmental issues (Ullah, Hasan & Uddin, 2013). Increasing teacher awareness of environmental issues results in environmental literacy and has a positive impact of their lesson delivery at school in the integration of EE themes into subject areas. Auwalu (2015) stated that the level of environmental awareness and attitude of secondary school learners towards the environment is extremely low.

2.4 TEACHERS' AWARENESS OF EE INTEGRATION IN THE SCHOOL CURRICULUM

The inclusion of EE into formal school curriculum is the most effective way of raising environmentally responsible citizens. The implementation of EE into school subjects can be enhanced through an integrative approach. By this, EE should be taught across-curricular in all school subjects by committed teachers in the classroom (Kimaryo, 2011).

According to Almers (2013), there are two distinctive paradigms that determine the change of attitude of people towards sustainability and responsible citizenship. These paradigms are *moralistic* and *educational*. The moralistic paradigm, according to Almer (2013), focuses on the development of positive behaviour of learners towards the environment. The education aspect of the paradigm is to inspire learners to prioritise learning to acquire knowledge. The study highlighted the need to show commitment, willingness and the zeal to act and identify problems and their causes.

Almers (2013) indicated the ability to use knowledge in building visions, finding solutions to unending global problems, influence and change conditions and applying knowledge acquired into practice. The influence of EE on learners' behaviour cannot be underestimated. Teachers integrating EE into their respective subjects can make

a positive impact in changing the behaviour of learners, which inspires the spirit of 'ubuntu', and responsible citizenship behaviour (Le Grange, 2012).

Integration of EE into the senior secondary school curriculum may bring more meaning to learning. The FET in the South African education system is the final phase in the basic education systems and transitional phase to the society and job placement. The majority of learners, after their Grade 12 studies, take a gap year to work. Their exposure to the world and environmental issues call for the need to be environmentally literate.

2.5 TEACHERS' AWARENESS OF EE INTEGRATION ACROSS THE CAPS CURRICULUM

The newly revised curriculum is the only all-inclusive and concise document designed for all subjects at the GET and FET phases of the South African education system. This well-thought out document replaces numerous subject statements.

The CAPS document has received overwhelming endorsement from many stakeholders because of its simplicity and well-arranged content of various subjects. However, the implementation of the policy at the classroom remains complex to teachers (DoE, 2017:3). The implementation of EE across curriculum is quite challenging (Evans et al., 2012). The CAPS document requires all teachers from GET and FET phases to integrate environmental content, values, and skills into their subjects to increase environmental literacy of learners (Lotz-Sisitka, 2011). It is, thus, imperative to examine the awareness of teachers regarding EE integration. The researcher explained teacher awareness of EE as, being well informed about the national policy that requires all subject teachers to teach and integrate environmental themes into their respective fields of speciality.

The South African curriculum has undergone changes. Without the willingness of teachers to participate fully in the adoption of the changes, the future of the curriculum shall hit a snag (Adu & Ngibe, 2014). Since the inception of the integration EE across curricular, many researchers have sought to find out if teachers who are frontiers of this agenda are fully aware of environmental issues and its integration into other subjects.

According to a study conducted in Lesotho, the government of Lesotho has strengthened the integration of EE in the education system in collaboration with the Danish government support termed as, Lesotho Environment Education Support Project (LEESP). The goal of this strategic project is to make teachers to be well informed about environmental issues and on how to integrate EE into their subjects (Raselimo, 2014).

Mokhele (2011) indicated that very few South African teachers have the experience and understanding of the focus of EE. It is argued that, most teachers are not conversant with the implementation of EE. The study further indicated that, schools implement the national policy on EE integration differently without any conformity to curriculum requirement. The researcher, therefore, concluded that due to lack of uniformity and conformity in the implementation EE across curricular, the ideal behind EE integration in the CAPS (2011) remains an "impossible dream" (Mokhele, 2011:85).

2.6 METHODS OF DELIVERY OF THE CONTENT OF EE

Teachers' perceptions on any educational policy are vital and determine the impact of the policy's implementation (Tuytens, 2014). Teachers' perception on the integration of EE into the school curriculum largely depends on their understanding of environmental education, its aims and objectives. What teachers perceive EE to be guides content methods and activities used for teaching EE. This influences how and whether they "integrate it at objective, content or implementation levels" (Obbo-Katandi, 2009:13).

The integration of EE has made teachers to be sceptical with regards to effects of the new policy on their professional development and school improvement (Flores, 2012). Knowing teachers' understanding and interpretation of EE integration shall bring to light the success and failure of the integrated approach.

Sehlola (2007) states that teacher professional development underpins the success of EE integration. The researcher further argued that most teachers in South African public schools are not adequately qualified to teach EE as an integrated component. Mokhele (2011) states that in South African schools, all teachers are expected to integrate EE in their subject content areas, but there is no specific guidance

concerning EE implementation. Obbo-Katandi (2009) claims that teachers' perception of environmental education integration in the school reveals their understanding of the subject matter; how they perceive environmental education influences their methods of teaching and perceptions of learners. As a result, teachers' interpretation of EE shall be the conduit in the Integration of EE into school subjects.

2.6.1 Teaching methods

Teaching methods can be defined as the overall principles, pedagogy and organisation strategies used for classroom instruction. A teacher's choice of a specific method is largely influenced by his or her preference based on educational viewpoints and dynamics in the classroom, vision and mission statement of the school, curriculum requirement and subject area(s) (2U Inc, 2018).

2U Inc (2018) further indicated that teaching theories can be categorised into two broad headings namely: teacher-centred approach against learner centred approach, and high-tech material use against low-tech material use, as reflected in the diagram below.

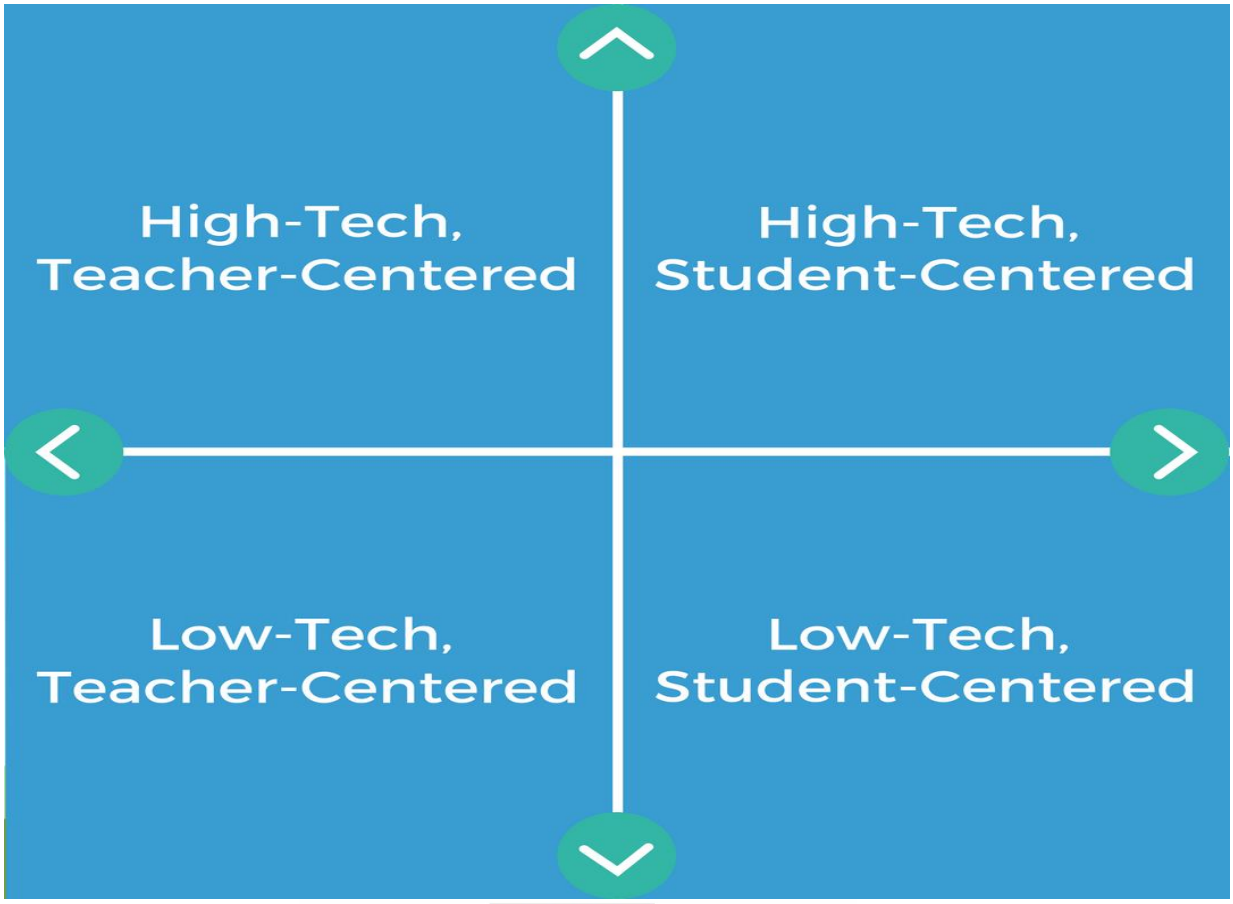


Figure 2.4 Modified from teaching methods (2U Inc, 2018)

2.6.2 Teacher-Centred Approach

According to 2U Inc (2018), teachers take centre stage in this method of teaching whereby learners are regarded as empty vessels who passively receive knowledge from teachers without any active participation. The teacher singularly handles the instructional time, and this model of teaching is lecturing learners and giving direct instruction. Assessment of teaching and learning is mainly done through measured scored tests. The teaching strategy is that learners take direct instructions from the subject teacher and learn through listening attentively and watching what the teaching is doing. Teachers primarily use well-prepared lesson plans and notes to deliver their lessons systematically**.** The direct instruction normally directs what teachers are to deliver, the activities that learners are to complete and the stipulated time for a specific period.

2.6.3 Learner-Centred Approach

Teachers are very instrumental in this method of teaching; teachers and learners play active roles in the learning process. A teacher's primary role is to facilitate and coach the learning process by getting learners involved in learning activities such as group discussions, group projects and assignments to ensure active learner participation. Teaching and learning is measured through formal and informal assessment. In this approach, teachers get feedback of their teaching through class activities during instructional time (2U Inc, 2018).

Inquiry-based teaching and learning falls under the learner-centred approach. Learners are motivated to ask questions in relation to what they want to know about the world around them. Learners present findings of such investigations formally. In this situation, teachers ask high-level questions and make research suggestions about the process rather than the content. At the end of the inquiry cycle, learners reflect on the experience and what they have learnt. Learners study how their findings relate to other topics of interest, which opens more room for further investigations into new fields of study.

2.6.4 High Tech Approach

In an era of technological development in the 21st century, technology plays huge role in teaching. Teachers employing this approach use different technologies available during instructional hours. Most teachers use projectors, desktop computers, laptops and tablets in their lesson delivery. Others adopt a paperless classroom by sending assignments/ projects to learners through learners' portals on the internet. Learners use the internet to search for information needed for their education and to connect with others globally, which makes the world a global village (2U Inc, 2018). The study further argued that, one of the models of instruction of a high tech approach is a *flipped classroom*. In this approach, learners listen or watch pre-recorded audio or video at their own convenience both at home and in class. They learn at their own pace, depending on the teacher's instruction. Teachers may assign different learners to different audio-visuals based on teachers' personal preference, the objective of this lesson is to ensure that learners master specific topics. This instructional model is classically a learner-centred approach. However, teachers play huge role in directing how learners utilize the audio-visuals, which makes the model bit teacher-centred.

2.6.5 Low Tech Approach

According to 2U Inc (2018), this approach of teaching and learning is the classical method. In this approach, teachers do not utilize technology in their teaching. It is the traditional method of teaching where there is physical presence of teachers and learners. Learners normally take handwritten notes from the board rather than typed or projected notes. There is overreliance on textbooks and workbooks by both teachers and learners instead of technology. This teaching method relies on direct instruction from teachers and demonstrations by teachers.

This method can be classified as the manual or traditional method of teaching. Learners learn far better in this approach due to their consistent interaction with their teachers. Examples of low-tech approach methodologies include:

(a) Kinesthetic: this is where teachers freely allow learners to move around and interact with each other, speaking with hands and gestures. This methodology is referred to as 'tactile learning' or 'hands-on learning'. This model is built on several ideas, which requires learners to be more creative to do things on their own. Teachers employ different techniques including: role play and drama to depict reality in the classroom; and

(b) Expeditionary methodologies involve "learning by doing" and active participation in learning activities. This includes fieldwork, learning expeditions, projects and case studies. This methodology enables learners to apply knowledge acquired in the real-world context. This best fits the teaching of EE in the school curriculum. This methodology is a project-oriented learning strategy that makes learners to explore a specific topic that affects their locality and school.

According to 2U Inc (2018), all these teaching methods and strategies mentioned above help teachers to gain a better understanding of how best to organise their teaching, classrooms and lesson delivery during instructional time and lastly, how to effectively impact knowledge to learners from diverse background.

According to Gill (2013), every teacher has a specific way of teaching in his or her classroom. Teachers' methods of teaching exclusively depend on the dynamism in the classroom; these include the needs of learners and availability of teaching materials. Contemporary teachers are more flexible in adjusting their teaching styles

in addressing the needs of learners, ranging from varied subjects and topics and style of teaching. Gill (2013) further discussed five teaching approaches commonly used by many teachers. The researcher explored these fundamental teaching methodologies under the following headings:

2.6.6 The Authority or lecture Approach

According to Gill (2013), the authority model is a teacher-centred approach that involves extensive and illustrations, and learners normally take lecture notes. Gill further outlined the merits and demerits of this approach as follows:

(a) **Pros:** this approach is more applicable in dealing with a sizeable group of learners. It requires auditoriums with projectors and computers to make presentations and is suitable for reading subjects like English language and history.

(b) **Cons:** this approach is not a suitable model for teaching learners in primary and high schools because learners do not take active participation in the teaching process. There is less interaction between learners and teachers, and it is more appropriate for mature students.

2.6.7 Demonstrator or coach style

This approach works like the authority style; however, teachers play a significant role by making demonstrations, presentations and activities to depict the content knowledge. Subjects that normally use this style of teaching include: Mathematics, Sciences and Music studies.

(a) **Pros**: This model gives teachers an advantage to integrate many variables into their teaching through audio visual presentations.

(b) **Cons:** it is a challenge to teach learners from diverse backgrounds with this model as learners with special needs may not get the needed attention from teachers due to sizeable classrooms.

2.6.8 The Facilitator or activity style

Gill (2013) explained this model as a teaching and learning process helping the learner to learn independently and assisting the learner to develop potential.

(a) **Pros**: This model is suitable for the teaching of sciences and develops learners' thinking capability. Learners are trained to ask more questions and develop problem-solving skills through investigation.

(b) **Cons**: It challenges teacher to interact with learners and prompt them toward discovery rather than lecturing facts and testing knowledge through memorization. Therefore, it is difficult to measure success in tangible terms.

2.6.9 The Delegator or group style

Gill (2013) indicated that this model is best suitable for curriculum that requires laboratory activities such as Chemistry and Biology, and other subjects that warrant peer feedback, like debate and creative writing.

(a) Pros: Guided innovation and inquiry-based learning places the teacher in an observer role that motivates learners by working toward collective goals.

(b) Cons: This contemporary model of teaching is sometimes slated as marginalising the teacher's authority in classroom. As a delegator, the teacher acts more as an adviser than the classical model of teaching of a teacher-centred approach.

2.6.10 The Hybrid or blended style

This is an integrated teaching approach that combines teachers' personal traits and interests with learners' needs and curriculum.

(a) **Pros**: this teaching method makes learners to take active participation in class activities. It enables teachers to modify their style to meet the needs of learners and adopt appropriate teaching strategies to respond to needs of learners

(b) **Cons**: this approach, irrespective of its merits, enables teachers to use varieties of styles on the subject matter, and this may result in complications on the minds of learners. Teachers risk losing focus on the objectives of their

lessons. This model is more appropriate for the teaching of Sciences, Mathematics, English and History.

2.6.11 what teaching methodology is best for today's learners?

According to Gill (2013), even though teaching styles can be captioned under five headings, it is not binding for a teacher to be stuck with one approach. In this 21st century, teachers are encouraged to use the hybrid method of teaching, blending their personal interest and the needs of learners in its diversity. Successful teachers share three mutual features:

- effective classroom management skills;
- lesson mastery; and
- positive expectations.

All teachers should have in mind these goals whenever they are thinking of a teaching methodology to adopt in their classroom. Contemporary teachers must cultivate a teaching methodology that meet the needs of learners in a diverse classroom. An effective teaching methodology sets a balance to accommodate both gifted and slow learners and those with special needs. A well-articulated and differentiated teaching methodology and a balanced mixed method can help reach all students in each classroom.

2.7 TEACHING METHODS OF EE

According to Kostova and Atasoy (2008), raising environmentally responsible learners who shall stand the test of time requires vigorous classroom teaching and learning. Learners spend almost eight hours at school, which constitutes approximately 34 percent of their time at school. The motive behind schooling is to shape the thinking and personality of learners for tomorrow's world and making meaningful contribution to their generation. Their contribution to society at later stage in life largely depends on the quality of education received to influence their personal qualities and belief systems.

In this contemporary period, the environment is endangered by human activities, which has resulted to the depletion of ozone layers and global warming. It is imperative for teachers to adopt appropriate teaching methods to integrate EE into their respective subjects. An appropriate teaching methodology is one of the factors that influences successful teaching and learning (Kostova & Atasoy, 2008).

According to Kostova and Atasoy (2008), it is always crucial to differentiate between the processes of learning from the learning outcomes to ascertain their interrelatedness. The process of learning is a conscious effort made by learners to complete educational requirements, interests, aims and objectives in line with social needs of the community in the social context of adaptation and integration. Kostova and Atasoy further indicated that, learning by doing is commended.

Learners acquire knowledge, values and skills through experiential learning. This nurtures the level of competence of learners, and education is not limited to a specific period of human life but rather, it is a lifelong endeavour. An effective learning process is measured by the results attained and aims of the education process. People need to learn through formal education to cope and solve issues confronting the modern society. It is, therefore, imperative for every education system to be built on four pillars, namely, learning to live together, learning to know, learning to act and learning to be.

Kostova and Atasoy (2008) add that successful environmental learning largely depends on innovative ideas in the classroom, developing independent minds of learners to build self-confidence and personal aspirations. Fruitful learning depends on a dramatic change of attitude of learners and teachers. In conclusion, Kostova argued that a teacher plays a huge role as a partner, facilitator, leader, stimulator, force and master of learners' effective learning.

According to Abid (2006), the quality of every education system largely depends on the cooperation between learners and teachers. This hinges on a positive relationship and the eagerness of the teacher and learner, so that each element can learn how to progress. Effective teaching and learning of EE have two main categories: the first dimension is the development of innovative techniques, skills, values, abilities and understanding of learners concerning the environment, environmental problems and its protection. The second category is based on

transformation in a learner's knowledge, value, attitude and skills due to teaching and learning experiences. These two classifications rely on teachers' pedagogy and choice of teaching methods. Abid (2006) indicated that, another way to ensure effective teaching and learning of EE is through experiential learning**.** Learners should be introduced to practical environmental issues for them to design their own solutions towards the conservation of the ecosystems**.** Teachers or facilitators are to organise field trips for learners to have first time experiences. These field trips may help learners to understand the complex nature of environmental issues and result in a strong partnership between environmental conservation bodies promoting EE and learners in pursuit of finding solutions to the unending environmental problems. This could result in raising learners who are confident and familiar with environmental issues**.**

Abid (2006) states that learners should be encouraged to participate in making decisions on environmental issues**.** The complex nature of environmental issues and strategies requires teachers and learners to deal with environmental problems. This calls for a pragmatic approach that includes all spheres of social, economic, organizational and ethical perspectives. Therefore, an active oriented approach is more effective in teaching EE to ensure active participation of learners in decision making to environmental problems. It is imperative for teachers to adopt teaching approaches that are effective and encourage learners to be participants and not spectators towards environmental conservation. Teachers' perception plays a huge role in the teaching of EE and closes the gap between learners and teachers to achieve the anticipated results.

This research study explored teachers' perceptions on EE integration. Abid argued that teachers need to equip learners with requisite knowledge to identify and solve environmental issues independently. In line with EE curriculum integration, teaching methods should enable learners to deal with environmental problems logically. The EE curriculum should be able to train learners who are more active, and teachers should guide learners in the teaching and learning process.

2.7.1 Significance of teaching methods of EE

Kostova and Atasoy (2008) indicated that effective learning of EE largely depends on relevant and appropriate teaching methodology used by teachers. They further argued that due to the dynamisms in the society, the entire educational system paradigm keeps changing based on social and technological advancement. The

study suggested group work, debate, peer teaching and learning, competition and cooperation and project work as some of the methods used by EE teachers.

The role of every EE teacher is to organize, direct, guide, help and support the inquiring cognitive activity of learners. The trend of knowing it all as a teacher has changed. Teacher does not need to know everything to explain simple concepts to learners. The teacher plays a role of a facilitator and directs teaching and learning by stimulating the interest of learners in asking thought-provoking questions, responding to their questions and assisting them to accept challenges and divergent views, analysing varied views, analytical thinking and creativity. It is of great importance for learners to develop self-reliance and adopt learning styles that suit individual needs rather than teacher dependence; this helps them to take total responsibility of their own actions and personal development (Kostova & Atasoy, 2008).

According to Kimaryo (2011), the aim of teaching EE in schools is developing environmental literacy by equipping learners with the relevant environmental values and skills to deal with environmental issues. It is further argued that, teaching and learning processes centralise on learners instead of directing the attention on content and subject teachers. With this narrative, EE requires adoption of a teaching methodology more learner-centred and activity-oriented. Teachers' pedagogical content knowledge is of great importance in the development of teaching and learning of EE. Teachers' content knowledge forms fundamental principles for teaching and learning that may have a direct impact on their teaching methods.

Battani, Sorrentino and Trovarelli (2018) indicated that knowledge is unceasing exchange of learning experiences gathered in life. The teacher is also a learner open to teaching-learning process concerning finding solutions to environmental issues and practices. This concept helps in building a sustainable environment that ensures greater environmental awareness.

2.8 CHALLENGES AND LIMITATIONS TEACHERS FACE IN THE INTEGRATION OF EE INTO THE GRADE 12 CURRICULUM

Integrating EE into other subjects creates several challenges and limitations in the entire school curriculum (Palmer, 1998). Mwendwa (2017) in his study in Tanzania on EE integration in secondary schools indicated that, Tanzania has complied with the global quest of EE incorporation into formal education systems. The research study conducted in Tanzania examines the height at which the secondary school

curriculum addresses environmental issues through the integrated approach of teaching and learning. The study further explored teachers' and learners' perceptions of EE integration into other school subjects. Participants in this study were teachers, learners and headmasters chosen a cross different disciplines of all classes from form I to form IV**.** In 1990, the Ministry of Education in Tanzania initiated and implemented policies to formally integrate EE into the formal education system. EE is currently integrated into all subjects in secondary schools in Tanzania and not as a stand-alone subject. The idea behind the inclusion of EE in the school curriculum is to make citizens to be well-informed about environmental problems and its conservation.

Mwendwa (2017) further argued that, Tanzania adopted the integrated approach in teaching and learning of EE in all schools, to address a gap in environmental education and environmental issues. Baxte and Jack (2008) argued that the integrative approach helps teachers to plan for the advancement of crucial skills that outdo individual aspects and disciplines. This approach in teaching is based on experiential learning**.** It constitutes various knowledge, skills, attitude and values from different subjects to build formidable understanding of various subject disciplines**.** This approach helps learners to build deeper understanding of diverse environmental issues.

EE integration into other subjects creates several limitations and challenges to education systems (Palmer, 1998). Integration of EE themes into other subjects brings about huge confusion on learners as they fail to develop a clear distinction between the environmental content area and the main subject. Learners are unable to connect knowledge acquired to environmental issues. Teachers, on the other side, find it difficult to connect EE content areas with the main subject content. Teachers lack a clear understanding of EE implementation in the classroom setup, so many do not use the integrative approach of teaching EE.

In conclusion, Mwendwa (2017) stated that inadequate knowledge, perceptions and beliefs of teachers affects the implementation of EE integration. Findings of this study revealed that most teachers in the secondary schools are not capable of teaching EE as they lack fundamental knowledge of EE. Integration of EE into traditional subjects does not balance the attention needed, and existing subjects may not get enough attention in terms of content delivery.

In an international study conducted in Greece, it was revealed that absence of proper planning, lack of relevant “lifelong training of teachers on general environmental themes, lack of moral and financial incentives and inadequate teaching and learning material for teachers are some notable concerns that impede the success of EE at schools (Goussia-Rizou et al., 2004:30).

2.9 SOUTH AFRICAN CONTEXT

It takes time to implement new ideas and policies (Clark Jr, 2011). Clark Jr, and Mokhele (2011) noted that there are many hindrances in the implementation of EE integration. Mokhele (2011) conducted a study in two different schools in Mpumalanga province**.** The case study focused on two primary school teachers on integration of EE into respective teaching subjects. The findings of the study revealed that; a teacher’s level of competence is vital. The researcher explored teachers’ basic knowledge on how integration of EE is implemented in the classroom setup at different schools.

It was revealed that there is total lack of support from provincial and district education offices in building competent teachers who can integrate EE into their teaching. Mokhele further argued that Mpumalanga schools have implemented the national environmental education policy, like other eight provinces in South Africa. This policy urges all schools in South Africa to integrate EE into all subject areas at all levels of education. The national policy document does not define a specific time allocation for EE to be taught, and the curriculum does not recognise EE as a stand-alone subject but rather as an integrated component in the curriculum. The study revealed that EE implementation is clearly marginalised in the classroom. Teachers focus much on their subject content instead of striking a balance of integrating EE themes in the content. Another setback in the implementation of EE is lack of formal policy guidelines to assess the teaching of EE as an integrated theme.

Mokhele (2011) indicated that curriculum implementation is compulsory for all public schools in South Africa, and many teachers have different perceptions regarding implementation as an integrated component. Mokhele argued that, most teachers in government schools lack ideas towards successful implementation of the curriculum because they are not trained on integrating EE into their instructional hours. It was discovered that although there is well-defined national policy on EE integration, the two schools implement the same policy differently

due to lack of understanding of the policy. The study concluded that there was no EE integration, as trumpeted by national policy makers, because teachers only concentrate on the content-base of their respective subjects instead of incorporating EE themes in their lesson delivery. A major factor that affects the success of EE integration is the teacher's inability to incorporate EE into the curriculum logically (Hart & Oonyo, 2003).

2.10 CONCLUSION

The researcher reviewed extensive literature in relation to the theoretical framework of Opportunity to Learn (OTL). In addition, with the contribution of local, national and international literature to shape this study. Chapter 3, shall discuss the research methodology used in this study**.**

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 INTRODUCTION

Creswell (2017) defined research methodology as the procedure adopted in a research study. Research study can be explained as the systematic investigation into a problem to establish ideas and facts to find solutions to problems. This chapter discusses the research methodology adopted in the research. These include research paradigm, research approach, research design, data collection method employed, instruments, the research sample and sampling techniques, data analysis, and data trustworthiness.

Cohen et al. (2013) indicated that the methodological framework of a study seeks to explore and examine the correlation between the research problem, data collection and analysis instruments. This chapter of the study concludes with ethical concerns adopted in the research study.

3.1 RESEARCH APPROACH

Research approaches are well-structured process of a study which run through data collection and interpretation of data (Creswell, 2013). The study adopted a qualitative research approach, as discussed briefly in chapter one.

According to Hesse-Biber, Nagy and Leavy (2010), qualitative approach to research is the pivotal point from which to conduct a study. Adoption of this approach seeks the meaning of a specific phenomenon. Qualitative focus on the collective meaning people attribute to their personal experiences, environments, situations as well as the meaning people attach to a text or subject matter. The approach is interdisciplinary oriented and cuts across different academic divides. There are many aspects of qualitative research.

3.1.1 Dimension of Qualitative Research

Qualitative research has four (4) specific dimensions. The major aspects are ontology, epistemology, methodology and methods (Hesse-Biber et al., 2010).

(a) Ontology

An ontology is a philosophical belief system about the nature of social reality. It encompasses what can be known and how as one's perspective of social reality. It constitutes what exists, what it looks like, what makes up and interacts with each component. In simple terms, ontology is the perception people have about the nature of social issues. Ontology study involves what we mean and the existence of something (Mark, 2010).

Hesse-Biber et al. (2010) add that ontology raises questions about the nature of reality. Researchers' ontological views influence the selection of topics to be studied, setting up of research questions and plans to be used in carrying out the research study. Al-Saadi (2014), reiterated that, ontology relates to the study of the nature of existence and the relationship between different aspects of society. These characteristics include social and cultural phenomena that exist in our society. It is the assumptions people make concerning the realities of nature. Al-Saadi (2014) further argued that ontology are issues which exist within societies, the nature of the world we live in today and our perceptions about it. Briefly, ontology relates to our beliefs about the kind and nature of reality and the social world.

(b) Epistemology

Epistemology is interested in the origins and nature of knowing and the construction of knowledge. It is about the notion that one makes about the very basis of knowledge – its nature and form, how it can be acquired and how it is communicated to other human beings. It is a way of looking at the world and making sense of it. It involves knowledge and encompasses a certain level of understanding of what that knowledge entails. Epistemology deals with the nature of knowledge and its possibility (Cohen et al., 2007).

In simple terms, epistemology is the assumptions people make about or hold about knowledge which influence social behavioural patterns. In this study, the researcher refers to epistemology as factors which the researcher need to consider in the selection of appropriate methods relevant to epistemological assumptions. This

includes knowledge viewed as hard, objective and tangible. This assumption enabled the researcher to examine views, understanding and perceptions of EE integration into the Grade 12 subjects.

(c) Methodology

One of the key dimensions of the qualitative approach is the methodology employed in the study. Methodology offers knowledge that aims at societal issues or problems. It primarily focuses on the lived experiences of the respondents placed in its natural context (Tracy, 2012).

Pattern and Newhart (2017) state that methodology is a chronological approach of building up knowledge. It is the embodiment of procedures used in the entire process. These strategies include research paradigm, approach, research design, sample and sampling techniques and data trustworthiness. The researcher adopted a phenomenological method to seek views and lived experiences of respondents.

(d) Methods

Research methods discuss tools used to acquire thoughtful, accurate information or data about a study. These techniques help to manipulate and interpret data (Pattern & Newhart, 2017). Three distinctive qualitative methods commonly used are participant observation, in-depth interviews and focus groups. Each method is specifically used to obtain a specific type of results or data (McMillan et al., 2010).

Participant observation: this method is suitable for the collection of data in its natural setting.

In-depth interviews: this is one of the methods used in the collection of data in a qualitative study, this method delves much into respondents' personal interests, experiences and perceptions in the natural context. This study adopted this method largely because it sought to find teachers perceptions' with regards to EE integration into the Grade 12 curriculum.

Focus groups: this is the effective method in the collection of data centred on cultural norms or beliefs of a specific group of people. This method gives in-depth understanding about issues emanating from the group under study (McMillan et al., 2010).

Creswell (2017) argues that qualitative methods are more flexible, and this allows intensive probing of issues to have in-depth understanding of lived experiences of the respondents and broadens interaction between the researcher and the study respondents. The next section discusses the characteristics of the qualitative research approach.

3.1.1.1 Features of qualitative research

Qualitative research can be defined as any kind of research that produces findings not arrived at by means of statistical methods. The researcher seeks better understanding and explores the phenomena under study in detail, and conclusions are not based on predictions or assumptions (McMillan et al., 2010).

In this study a qualitative method was used to establish the perceptions of teachers on the integration of EE into the Grade 12. Pattern and Newhart (2017) stated that qualitative research examines phenomena through collection of data through interviews, observation, field notes. This is type of academic research solely relies on interviews, observations and notes to collect data (Creswell, 2017).

Qualitative research largely examines people's words and actions in a descriptive manner that relates to the lived experienced by the participants. Qualitative research is further distinguished by its philosophic underpinnings based on a phenomenological point of view (Maykut & Morehouse, 2002).

Scholars have identified many qualities considered to be features of qualitative study. These include Creswell and Poth (2017), McMillan and Schumacher (2010), Patton (2005) and Maykut and Morehouse (2002). Below are listed characteristics of qualitative research and common opinions shared by these authors:

1. The source of data of qualitative research approach is collected in the respondent's natural setting. According to Patton (2005), a researcher seeks to observe, examine, describe and interpret the lived experience of the respondents.

Qualitative study has natural settings as the direct source of information. In this approach, the researcher engages the respondents in their working environment and spends quality time with them to gain relevant information concerning the phenomenon under study. In this qualitative study, the researcher was interested in knowing the views, understanding and perceptions of teachers in the integration EE

into the Grade 12 curriculum and how integration could positively impact the lives of learners and their community at large.

2. The researcher acts as the human tool of data collection and the key instrument in this study.

3. Qualitative researcher primarily uses inductive data analysis, as has been adopted in this study.

4. Qualitative data are descriptive, integrative and expressive language. The voices of both respondent and researcher are clearly heard in the data collected. The data collection is mostly in the form of words or pictures rather than numerical or statistical (McMillan et al., 2010). In this study, the researcher interviewed teachers and tape-recorded their responses.

5. Qualitative study uses an interpretive paradigm. Creswell and Poth (2017) argue that in an interpretivism paradigm, the researcher seeks the understanding of respondents' lived experiences aimed at discovering the meaning events have for the individuals who experience them, including the interpretations of those meanings by the researcher.

6. Qualitative researchers are much particular with the distinctive, pervasive, exceptionality of each phenomenon.

7. In qualitative study, researchers focus on the emerging process as well as the results of the research.

8. Trustworthiness is a special tool used to assess the relevance and accurateness of qualitative research data. Patton (2005) indicated that qualitative study has absolute characteristics of qualitative inquiry and strategic ideals that gives a clear definition.

9. Qualitative study seeks to discover phenomena. Instruments use more flexible, interactive style of seeking information and sorting out responses to questions.

10. Qualitative research uses semi-structured methods such as in-depth interviews focus groups, open-ended questions and participant observation

11. When researchers go to a particular setting with either pad and pencil, or video/audio recording equipment, they feel that action can be understood when observed in the setting in which it occurs.

12. Qualitative researchers want to know where, when, how and under what circumstances behaviour comes into being and historical circumstances and movements they are part of. Each act, word and gesture is significant in the eyes of the qualitative researcher.

13. Descriptive data-the data in qualitative research takes the form of words or pictures rather than numbers. Often, descriptive data contains quotations by informants to illustrate and substantiate the findings.

14. Data can include transcripts, field notes, photographs, video recordings, audio recordings, personal documents and memos. Qualitative research does not reduce pages of narration into numbers like quantitative researchers.

15. Nothing is taken for granted or overlooked by a qualitative researcher. Researchers take note of gestures, jokes, tone of voice, verbiage, decor, style of dress, response time, body language and a multitude of other details of their studies. All these factors influence the data collected (McMillan et al., 2010).

16. In qualitative study, researchers are concerned with process rather than simple outcomes. For qualitative researchers in education, the process has been beneficial in clarifying a self-fulfilling prophecy (McMillan et al., 2010).

17. Qualitative researchers analyse their data inductively and do not set out to find data to prove or disprove hypotheses that they have prior to their study.

Their theories come from the bottom up rather than the top down. The qualitative researchers' theory is grounded in the data and emerges as a piece of art that is yet to be created, rather than a puzzle where the image is already known (Cohen et al., 2013).

18. Qualitative studies are more open at the beginning and more directed and specific at the bottom. It is in the first part of the qualitative research where the qualitative researcher discovers the important questions. He/she does not assume to know important questions prior to beginning their research (Creswell & Poth, 2017).

19. Researchers can show their data in the form of transcripts and recorded material to their informants to make sure their interpretations informant responses is accurate.

According to Patton (2005) and Creswell and Poth (2017), the characteristics of qualitative research are interwoven and interdependent. Qualitative research study should, however, dictate fundamental questions to be investigated and plans for data collection strategies. The particular design of a qualitative study depends on the purpose of the study, information that will be most useful, and information with the most credibility. There are no restricted criteria for sample size in qualitative studies. Data is not analysed statistically. In this study, the researcher interviewed six (6) high school teachers at the FET phase to ascertain their views and perception regarding the integration of EE into their respective subject areas. Below, Cohen et al. (2013) and Creswell (2017) argue the merits and Demerits of qualitative approach:

3.1.1.2 Merits of qualitative research approach

(a) The qualitative researcher visits the respondents in their natural setting to seek information in its natural context;

(b) Qualitative research typically reads like a story written in language;

(c) Qualitative research is descriptive in nature and describes life from the point of view of the respondents;

(d) Qualitative research, as the name implies, does not involve numbers, figures, and statistical analysis;

(e) Data collection is less structured than quantitative research, and data collection has characteristics of flexibility, naturalness and open-endedness.

(f) The researcher in qualitative approach, becomes personally involved and minimally disrupts the natural setting and group being studied. Through triangulation, the qualitative researcher acquires different perceptions of the same subject interviewed;

(g) Qualitative research data is more detailed and less distorted than those of other research methods; and

(h) Qualitative research is the only feasible way to gather data from respondents who would otherwise avoid known researchers or behave artificially in the face of reactive methods.

3.1.1.3 Demerits of Qualitative research approach

Cohen et al. (2013) and McMillan and Schumacher (2010) identify the following demerits of the qualitative approach:

(a) The qualitative research approach has a relatively neglect the essence of external structural forces to shape behaviour. Questions whether, if carefully controlled interviews such as those in social survey are accurate, then the less controlled interviews carry even greater risks of inaccuracy. Many suggest that subjective reports may be incomplete and misleading.

(b) The researcher responded to these disadvantages of qualitative approach by ensuring reliability and validity in this study. Reliability in qualitative research includes sincerity to real life, context and situation-specifics, genuineness, completeness, detail, honesty, depth of response and meaningfulness to the respondents (Cohen et al., 2013).

(c) Qualitative reliability includes the uniqueness of situations such that the study cannot be replicated.

(e) The sources of bias are the characteristics of the interviewer, of the respondents and the substantive content of the questions (Cohen et al., 2013). Race, religion, gender, sexual orientation, status, social class and age are other sources of bias.

In order to understand and make sense of phenomena from the respondents' perspective or point of view, the researcher can approach the phenomenon from an interpretive, critical or postmodern stance. In this study, interpretive qualitative research has been adopted by the researcher as the study sought to understand the teachers' perceptions of EE integration into other subjects, specifically in the Grade 12 curriculum. The next section explores the research paradigm used in this study.

3.2 RESEARCH PARADIGM

As briefly discussed in chapter one, paradigm is the driving force behind a study. It is the inspiration for conducting a research (Cohen et al., 2013). In this paradigm, the researcher seeks the understanding of respondents' lived experiences. The study adopted an interpretivist paradigm to analyse systematically and objectively the direct experience of teachers teaching various subjects at the high school level. The researcher adopted this paradigm to seek participants' views, understanding and perceptions of the phenomenon in the study (Denzin & Lincoln, 2011). Interpretivism paradigm is discussed in detail in relation to the subject matter.

3.2.1 Interpretivist paradigm

The Interpretivist approach to a research seeks the understanding of lived experience of the respondents (Cohen et al., 2007). McMillan and Schumacher (2010) and Creswell (2017) argued that in this paradigm, the researcher depends on the respondent's views of the situation being investigated.

According to Mack (2010), the interpretivist paradigm can be referred to as an anti-positivist paradigm because the intent of interpretivist paradigm is in response to a positivism paradigm. Interpretivism can also be called constructivism because it underscores the capability of the individual to create meaning to a specific phenomenon. The interpretivist paradigm was greatly swayed by hermeneutics and phenomology. Hermeneutics is a study based on text interpretation in a historical context. Finding meaning to a particular situation forms fundamentals of the establishment of an interpretivist paradigm (Ernest, 1994). Hermeneutics forms an integral part of the interpretivist paradigm as indicated above.

According to Oilman (2007), *hermeneutics* involves four main elements that include, interpretation, understanding, pre-understanding and explanation. These components are discussed below:

Interpretation: the concept of hermeneutics emanates from this element, which is the medium through which one gains an understanding of a situation.

Understanding: is the process of having sufficient knowledge and an insight about a phenomenon. Hermeneutics understanding is when our actions or attitude is being affected or influence by our state of mind.

Pre-understanding: without pre-understanding, there is no understanding. Pre-understanding is based on prior knowledge about a subject matter or having relevant previous knowledge. It thrives on the level and scope of interpretation.

Explanation: The last element of hermeneutics is explanation. Interpretation is normally based on explanation. Explanation goes with understanding and vice versa. In order to explain something, you need to understand it first. In hermeneutics, explanation is based on theoretical knowledge.

Diagrammatic view of the main elements in Hermeneutics

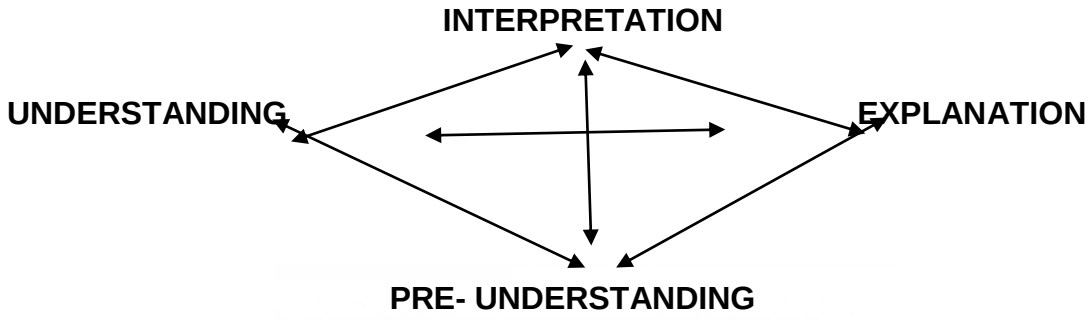


Figure 3.1 The interplay between the main elements in Hermeneutics (modified from Oilman (2007: 117)

According to Ernest (1994), the interpretivist paradigm encompasses both hermeneutics and phenomenology. Phenomenologist researchers promote the essence of considering human beings' subjective interpretations, their perceptions of the world and their lived experience, which seeks clarity and understanding of a particular phenomenon.

Merten (2014) stated that the interpretivist paradigm was nurtured out of the philosophy of Edmund Husserl's phenomenology and Wilhelm Dilthey's and other German philosophers' study of interpretive understanding known as hermeneutics. According to Mackenzie and Knipe (2006), interpretivist paradigm to research seeks the understanding of the lived experience of human endeavours.

Wahyuni (2012) indicated that the reality of Interpretivism is built on social variables and people's perception about a phenomenon. Interpretivist acknowledge persons with their own distinctive backgrounds, views, assumptions, and that experiences and opinions contribute effectively in building realities in a broader perspective through social involvement.

Wahyuni (2012) further argued that human views, perspectives, understanding and experiences are dynamic and can be changed at any given time. Interpretivist abhor objectivism and over-reliance on one source of information or truth as propounded by post-positivist. Interpretivist researchers interact with respondents under studied to construct meaning to their lived experiences; this paradigm normally adopts a qualitative research approach. Interpretivism uses narratives to describe a specific phenomenon, which gives in-depth understanding and meaning of the lived experiences of the respondents.

Creswell and Poth (2017) and Cohen et al. (2013) agree that Interpretivist researchers seek to unmask perspectives, views, opinions, understanding and meanings of social phenomena from respondents as a good social knowledge. Wahyuni (2012) further indicated that interpretivist researchers analyse issues from different perspectives. In view of this, the researchers' personal experiences, values and perceptions and respondents' perception influence the collection of data in the study.

The Interpretivism paradigm is based on socially constructed knowledge. Interpretivist researchers use the hermeneutics ideology and methodology to explore and interpret lived experiences of respondents (Potrac, Jones & Nelson, 2014). The researcher seeks to understand the meaning people have constructed about their world and their lived experiences.

According to McMillan and Schumacher (2010), the essence of this research paradigm is aimed to understand the meanings connected to the respondents' views, understanding and perceptions and their lived experiences. Patton (2005) argues that interpretive qualitative research is a conscious effort to understand situations in their individuality, as part, in a specific context through interactions. This understanding is an end in itself so that it is not trying to envisage what may occur in the future necessarily, but to appreciate the nature of that setting, what it means for respondents to be in that setting, what their lives are like, what is going on for them, what their meanings are and what the world looks like in that particular setting.

According to Creswell (2007), analysis of an interpretivism study seeks detailed understanding of the lived experiences of the respondents. This study aimed at understanding perceptions from the point of view of the respondents. In Interpretive study, the researcher strives to understand how respondents make meaning of a

phenomenon. This meaning is mediated through the researcher as an instrument, the strategy is inductive, and the outcome is descriptive.

Mackenzie and Knipe (2006) argued that in interpretive qualitative research study, the researcher strives to explore and understand a phenomenon, process, perspectives and worldviews of the people involved, or a combination of these. Data are collected through interviews, observations or document analysis. This study used interviews and document analysis to collect data. Literature was also used as reference. Interpretive research also involves special skills, which, while derived from everyday skills such as looking, listening and speaking, need to be developed in particular ways to become research skills. As a result, when conducting this study, the researcher relied heavily on listening, speaking and looking as the respondents shared their social worlds.

Cohen et al. (2013) indicated that in interpretive research, the researcher is the primary instrument for both collecting and analysing data. Interpretive researchers need to learn to listen, look, question and interpret. Another skill required of interpretive researchers is to describe and interpret their own presence appropriately in a research study. In interpretive research, subjective bias is not considered the enemy of truth, as is the case with positivist research, but the very thing that makes it possible for us to understand personal and social realities.

The researcher adopted the interpretivist paradigm because the study sought the understanding and perception of the lived experiences of teachers with regards to the integration of EE into their respective subject area of speciality. Teaching at the FET phase, specifically Grade 12, is quite demanding because of the need to prepare and complete syllabus for all examinable subjects. The intensity of work in the Grade 12 curriculum might affect the effectiveness of EE integration into teaching and learning. Therefore, researcher interviewed teachers in their natural for their perceptions on the EE integration into their subjects. The paradigm facilitates better understanding of teachers' perception because it provided clarity on the phenomenon in its natural context.

The challenge is then how the researcher used his or her subjective capacities, and where he or she may have lacked the necessary understanding to make proper sense of the phenomena being studied. The following section explores the research

design used in the study. Findings and data are collected through an in-depth interview. The next section explores the research design used in this study.

3.3 RESEARCH DESIGN

McMillan and Schumacher (2010) defined research design as a theoretical structure within which research study is built and conducted. It comprises the sequential flow that links data to the research questions and to the study's conclusion.

Creswell (2017) argued that a research design is the layout of the study that serves as a blueprint in a research study. The significance of a research design is to give direction on how to find evidence that addresses the research questions. The researcher adopted phenomenology as a research method for the purposes of this study. This study sought to find out teachers' perception on integration of EE across-curricular at the Further Education and Training (FET) phase; therefore, phenomenological design was the appropriate method used to find meaning to the lived experiences of the respondents.

3.3.1 Phenomenological method

Gary (2009), defined phenomenology as exploring how people's world is experienced and how structures of consciousness comprehend the world. Cohen et al. (2013) explain phenomenology as a theoretical point of view that advocates the study of direct experience taken at face value and one that sees behaviour as determined by the phenomena of experience, rather than by external, objective and physically described reality. Phenomenology is an enquiry that seeks to explore the inherent essence of appearances.

Gary (2009) and Cohen et al (2013) agree that phenomenology is anything of which one is conscious; anything that appeals to consciousness is deemed a legitimate area of philosophical investigation and thus researchable.

According to Munhall (2007), immersion is an important factor and a critical beginning of a phenomenological study. Phenomenological study cannot be done effectively or have any meaning if the researcher has not learned the language and come to understand the philosophical underpinnings of phenomenology. Munhall (2007) stated that some characteristics of immersion are:

(a) It describes and interprets the philosophical assumptions and underpinnings of a particular phenomenological perspective;
(b) It exemplifies the meaning of phenomenological concepts;
(c) It elucidates the worldview of phenomenology as an approach to answering questions;
(d) It enables us to understand what becoming phenomenology present to the world means.

One of the phenomenological inquiries is understanding the meaning of something, some experience, something that is human so that we can better understand the meaning of human beings.

Munhall (2007) indicated that phenomenological study is the study of lived experience of a phenomenon. Phenomenological researchers do not want to know simply what it is like, but what the meaning of it is. They seek the understanding of the meaning of things pertains to individual.

In many phenomenological studies, we see the prevalence of these approaches in the discussion of essential elements as explained in the below diagrammatic format.

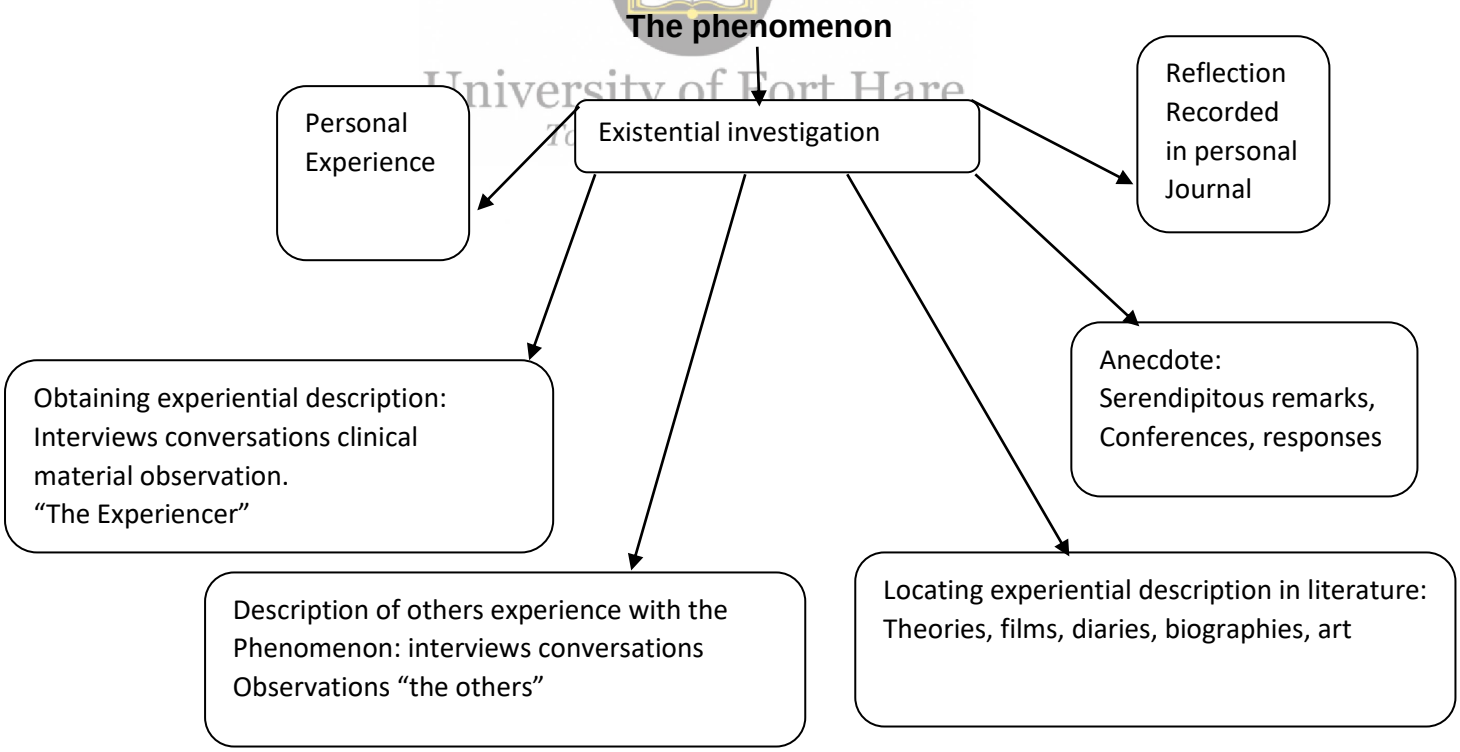


Figure 3.2 The phenomenon - modified from Munhall (2007:177)

In view of this, phenomenology is the descriptive study of how individuals experience a phenomenon from their own perspectives. This is suitable for the study as it is concerned with the phenomena of experiences as perceived by the Grade 12 teachers with regards to EE integration into their respective subjects.

The purpose of phenomenological research is to gain a vivid understanding of respondents' experience and capture accurate lived experiences by participants regarding their experience of an identified phenomenon (Creswell, 2013).

Therefore, this study utilized a phenomenological method to explore teachers' perception of EE integration into other subjects as phenomenon: the experiences of educators with the implementation of EE integration into Grade 12 curriculum. The next section discusses the sample and sampling techniques used this study.

3.4 SAMPLE AND SAMPLING TECHNIQUES

The study took place in the East London Education District in Eastern Cape Province of South Africa. The Department of Basic Education, through the initiative of the Policies of the White Paper, introduced a revised curriculum known as Curriculum Assessment Policy Statement (CAPS). The newly revised curriculum makes it mandatory for all teachers to integrate EE themes into their respective subjects. EE is not a stand-alone subject but rather an integrated component in the entire school curriculum (DOE, 2011). Its integration into other subjects makes teaching and learning a collective responsibility for teachers. The onus, therefore, lies on educators to integrate EE into teaching and learning processes so that it enhances effective acquisition of knowledge with regards to EE.

3.4.1 Sample

A sample can be defined as a group of respondents or participants from whom the data of the study is collected. It is further argued that a sample is a quota of the total set of objects or persons that constitute the subject of the study, and comprises a number of individuals selected from a population for the purpose of a research study (McMillan & Schumacher, 2010).

Patton (2005) and Cohen et al. (2013) agrees that a sample is a subset of measurements drawn from a population in which the study is centred. They argued that it is an extraction small portion from a wider population. The sample size of qualitative research is normally small in nature (Ritchie, Lewis, & Elam, 2013).

For the purposes of this study, the researcher sampled 6 teachers teaching different subjects in one Secondary Schools in the East London Education District. The study was conducted in one public high school in the Grade 12 stream in East London Education District, Eastern Cape Province. This study examined six (6) Grade 12 teachers' perceptions of the integration of environmental education across curricular and how they integrate EE into their lesson delivery. In this qualitative interpretative research study, respondents were carefully selected for the purpose of the study in order to achieve the expected results. The next section discusses the sampling technique used by the researcher.

3.4.2 Sampling techniques

There are two methods of sampling, namely, probability or random sampling and non-probability sampling or purposive sampling. The difference between the two is that in probability or random sampling, the sample is drawn widely from the wider population while in non-probability sampling or purposive sampling, the researcher chooses the sample to satisfy the researcher's needs (Cohen et al., 2013).

Sampling refers to approaches that assist the researcher to select a sub-group as a basis for making inferences about the larger group (Ritchie, Lewis & Elam, 2013).

3.4.3 Purposive sampling

Creswell (2013) states that purposive sampling is applicable when the researcher's knowledge of the population enables him or her to ensure that the sample is most representative of the population. Purposive sampling was used to choose the respondents in this study.

According McMillan et al. (2010), purposeful sampling is a technique whereby the researcher selects specific elements of the population useful in collection of data which shall be a representative or informative about the study of interest.

Purposive sampling represents a group of different non-probability sampling techniques. Also known as judgmental, selective or subjective sampling, purposive sampling relies on the judgement of the researcher when it comes to selecting respondents to be studied. Usually, the sample being investigated is quite small, especially when compared with probability sampling techniques.

Mouton (2008) and Cohen et al. (2013) argue that purposive sampling is appropriate when the sample is most representative of the population. In purposive sampling, the researcher knows that the respondents are likely to produce valuable information related to the study. There are several qualitative research designs that researchers can adopt in their studies. Achieving the goals of such qualitative research designs requires different types of sampling strategy and sampling technique.

In qualitative study, researchers use small, information-rich samples selected purposefully to allow the researcher to focus in-depth on issues related to a specific phenomenon. Based on the intent of the research, the study adopted a purposeful/ purposive sampling technique. In this study, the researcher selected six (6) Grade 12 teachers from one public high school teaching different subjects. The next section discusses in detail advantages and disadvantages of purposive sampling.

3.4.3.1 Merits of purposive sampling

1. One of the major advantages of purposive sampling is the extensive choices of sampling techniques that can be used across such qualitative research designs; purposive sampling techniques range from homogeneous sampling through to critical case sampling, expert sampling and more;

2. The numerous purposive sampling techniques each have different goals. They can provide researchers with the reason to make generalisations from the sample being studied, whether such generalisations are theoretical, analytic and/or logical in nature;

3. Qualitative research designs can involve multiple phases, with each phase building on the previous one. In such instances, different types of sampling techniques may be required at each phase;

4. Purposive sampling is useful in these instances because it provides a wide range of non-probability sampling techniques for the researcher. For instance, critical case sampling may be used to investigate whether a phenomenon is worth investigating further, before adopting an expert sampling approach to examine specific issues further (Laerd, 2015);

5. Purposive sampling provides options. When a targeted sample needs to be reached quickly, the different types of sampling make it possible to make generalizations from the results; and

6. Research designs can involve multiple phases. Each phase in purposive sampling can build upon the previous one. That means different sampling technique types can be used in each phase, which makes it possible to achieve a wider range of non-probability sampling for researchers to draw conclusions upon. It allows for identifying phenomena that may require further investigation.

3.4.3.2 Demerits of purposive sampling

1. Purposive samples, irrespective of the type of purposive sampling used, can be highly prone to researcher bias. The idea that a purposive sample has been created based on the judgement of the researcher is not a good defence when it comes to alleviating possible researcher biases, especially when compared with probability sampling techniques that are designed to reduce such biases. However, this the judgemental, subjective component of purpose sampling is only a major disadvantage when such judgements are ill-conceived or poorly considered; that is, where judgements have not been based on clear criteria (Laerd, 2015);

2. The subjectivity and non-probability based nature of unit selection (selection of respondents), in purposive sampling means that it can be difficult to defend the representativeness of the sample. In other words, it can be difficult to convince the reader that the judgement used to select units to study was appropriate. For this reason, it can also be difficult to convince the reader that research using purposive sampling achieved theoretical/analytic/logical generalisation;

3. Purposive sampling does not account for proportionality as one of its primary concerns. The goal is to find a range of cases to provide as much insight as possible in the fastest amount of time;

4. Purposive sampling is based on the researcher. That means their conscious or unconscious bias goes into the data being collected. That bias may make the data seem valid but can also influence the data and provide false results; and

5. Defending purposive sampling can be challenging sometimes because researchers use their judgment in selecting cases, people, or targets for purposive sampling, it can be difficult to defend the conclusions reached from the data.

Readers typically need additional convincing through other forms of data gathering to find that the results from this type of sampling are valid.

These purposive sampling advantages and disadvantages display that it can be a fast form of data collection. They also exhibit that there is an inherent bias that researchers must account for in their work to validate data collected.

3.5 DATA COLLECTION METHODS

In the adoption of appropriate instruments, the researcher was inspired by the nature of the research problem and the type of questions to be addressed. In addition, the choice of the paradigm and the research design also guided the researcher in adopting the instruments considered relevant to collect data that addressed the key issues of the study.

3.5.1 Interviews

The term 'interview 'is derived from Latin and means, "see each other". In general, interview is nothing but a formal meeting between an interviewer and an interviewee where questions are asked by former and answered by later (Van Manen, 2016). An interview is a face-to-face interaction between the interviewer and the respondents in a study. In this qualitative study, the researcher used in-depth interviews as a tool for the collection of data. In-depth interviews, as a process of using open response questions to seek information from the respondent, are an extensive, long, probing technique (McMillan et al., 2010).

Johnson and Turner (2003) and Smith et al. (2009) indicated that in-depth interviews help the researcher to probe further to bring clarity on the study. The study sought to find out teacher perception on EE integration across-curricular. It was, therefore, imperative for the researcher to engage the respondents in more detailed interviews to collect credible data. Therefore, the choice of in-depth interviews was relevant for the study.

In view of in-depth interviews, the researcher adopted an interview guide approach. Johnson et al. (2003), describes this approach as where topics for the interview are pre-specified and listed on an interview protocol. However, the researcher is not restricted to follow the questioning sequentially as the wording can be re-framed to cover more information for the study. The researcher conducted the interviews in a comfortable atmosphere, and interview questions were rephrased to confirm data.

According to Smith et al. (2009), interviews are adopted when it seems the targeted respondents are unlikely to respond to a written survey. The researcher arranged interviews with the selected school where he interacted and interviewed six (6) Grade 12 educators teaching different subjects. Cohen et.al (2013) indicated that an interview may be employed as the primary source of collating data, having direct influence on the research objectives. Any study that features divergent views and strong subjectivity is premised in the qualitative domain. In this research study, data was collected from six (6) Grade 12 educators through the use of interviews to gather as much information as possible on their experiences and perceptions with the implementation of EE into their respective subject areas.

According to Mouton (2008), an interview is a widely used to access respondents' experiences and their inner perceptions, attitudes and feelings of reality. The basic interview is one of the most frequently used methods of data collection within the qualitative approach. It is further argued that the qualitative interview design as characterized by being flexible, interactive and continuous. Interviews produce in-depth, insightful and detailed data that can be readily validated and most likely provide sought-after understanding (Denscombe, 2005). When interviewing Grade 12 educators, they were expected to share their lived experiences and perceptions regarding the integration of EE into their respective subjects.

An interview is generally a qualitative research technique involving asking open-ended questions to respondents and elicit data about a subject. The interviewer is the subject matter expert who intends to understand respondents' opinions in a well-planned and executed series of questions and answers. Interviews are similar to focus groups and surveys regarding garnering information from the target market. However, they are entirely different in their operation – focus groups are restricted to a small group of 6-10 individuals whereas surveys are quantitative in nature. Interviews are conducted with a sample from a population and the key characteristic they exhibit is their conversational tone (Matthews & Ross 2010).

3.5.1.1Types of Interviews in research

A researcher has to conduct interviews with a group of participants where information can only be obtained by meeting and personally connecting with a section of their target audience. Interviews offer researchers a platform to prompt their participants and obtain input in detail. There are three fundamental types of interviews in research (Denscombe, 2005).

Structured Interviews

Structured interviews are defined as research tools that are extremely rigid in their operations, they allow very little or no scope for prompting participants to obtain and analyze results. It is, thus, also known as a standardized interview and is significantly quantitative in its approach. Questions in this interview are pre-decided according to the required information (McMillan & Schumacher, 2010).

Structured interviews are overly used in survey research to maintain uniformity throughout all the interview sessions. They can be closed-ended as well as open-ended – according to the type of target population. Closed-ended questions can be included to understand user preferences from a collection of answer options, whereas open-ended can be included to gain details about a particular section in the interview (Matthews & Ross, 2010).

Advantages of structured interviews:

1. Structured interviews focus on the accuracy of different responses due to which extremely organized data can be collected. Different respondents have different type of answers to the same structure of questions – answers obtained can be collectively analyzed;
2. They can be used to get in touch with a large sample of the target population;
3. The interview procedure is made easy due to the standardization offered by structured interviews;
4. Replication across multiple samples becomes easy due to the same structure of interview;
5. As the scope of detail is already considered while designing the interview, better information can be obtained, and the researcher can analyze the research problem in a comprehensive manner by asking accurate research questions;
6. Since the structure of the interview is fixed, it often generates reliable results and is quick to execute; and
7. The relationship between the researcher and the respondent is not formal; the researcher can clearly understand the margin of error in case the respondent either agrees to be a part of the survey or is just not interested in providing the right information (McMillan & Schumacher, 2010).

Disadvantages of structured interviews:

- Limited scope of assessment of obtained results;
- The accuracy of information overpowers the detail of information;
- Respondents are forced to select from the provided answer options;
- The researcher is expected to always adhere to the list of decided questions irrespective of how interesting the conversation is turning out to be with the participants; and
- A significant amount of time is required for a structured interview.

Semi-Structured Interviews

Semi-structured interviews offer a considerable amount of leeway to the researcher to probe the respondents, along with maintaining basic interview structure. Even if it is a guided conversation between researchers and interviewees – an appreciable flexibility is offered to the researchers. A researcher can be assured that multiple interview rounds will not be required in the presence of structure in this type of research interview (McMillan & Schumacher, 2010).

Keeping the structure in mind, the researcher can follow any idea or take creative advantage of the entire interview. Additional respondent probing is always necessary to garner information for a research study. The best application of semi-structured interviews is when the researcher does not have time to conduct research and requires detailed information about the topic.

Advantages of semi-structured interviews

- Questions of semi-structured interviews are prepared before the scheduled interview, which provides the researcher with time to prepare and analyze the questions;
- It is flexible, but maintains research guidelines;
- Researchers can express the interview questions in the format they prefer, unlike the structured interview;
- Reliable qualitative data can be collected via these interviews; and
- Flexible structure of the interview.

Disadvantages of semi-structured interviews

- Participants may question the reliability factor of these interviews due to the flexibility offered; and
- Comparing two different answers becomes difficult, as the guideline for conducting interviews is not entirely followed. No two questions will have the exact same structure, and the result will be an inability to compare are infer results.

Unstructured Interviews

Also called as in-depth interviews, unstructured interviews are usually described as conversations held with a purpose in mind – to gather data about the research study. These interviews have the least number of questions as they lean more towards a normal conversation but with an underlying subject.

The main objective of most researchers using unstructured interviews is to build a bond with the respondents due with a high chance that the respondents will be 100% truthful with their answers. There are no guidelines for the researchers to follow, and they can approach the participants in any ethical manner to gain as much information as they possibly can for their research topic.

Since there are no guidelines for these interviews, a researcher is expected to keep the approach in check so that the respondents do not sway away from the main research motive. For a researcher to obtain the desired outcome, he/she must keep the following factors in mind:

- Intent of the interview;
- The interview should primarily take into consideration the participant's interest and skills;
- All the conversations should be conducted within permissible limits of research and the researcher should try and stick by these limits;
- The skills and knowledge of the researcher should match the purpose of the interview; and
- Researchers should understand the do's and dont's of unstructured interviews.

Advantages of Unstructured Interviews

- Due to the informal nature of unstructured interviews – it becomes extremely easy for researchers to develop a friendly rapport with the participants. This leads to gaining insight in extreme detail without much conscious effort.
- The participants can clarify all their doubts about the questions, and the researcher can take each opportunity to explain his/her intention for better answers; and
- There are no questions that the researcher has to abide by, and this usually increases the flexibility of the entire research process.

Disadvantages of Unstructured Interviews

- As there is no structure to the interview process, researchers take time to execute these interviews.
- The absence of a standardized set of questions and guidelines indicates that the reliability of unstructured interviews is questionable; and
- In many cases, the ethics involved in these interviews are considered borderline upsetting.

3.6 METHODS OF RESEARCH INTERVIEWS

There are three methods to conduct research interviews, each of which is peculiar in its application and can be used according to the research study requirement.

Personal Interview

Personal interviews are the most used type of interviews, where the questions are asked personally directly to the respondent. A researcher can design his/her survey from notes on the comments that stand out from the interviewee.

Advantages

- Higher response rate;
- When the interviewees and respondents are face-to-face, there is a way to adapt the questions if this is not understood;
- More complete answers can be obtained if there is doubt on both sides or particular information is noted as remarkable; and

- The researcher has an opportunity to detect and analyze the interviewee's body language at the time of asking the questions and taking notes about it (Mouton, 2008).

Disadvantages

- They are time-consuming and extremely expensive;
- They can generate distrust on the part of the interviewee since they may be self-conscious and not answer truthfully;
- Contacting interviewees can be a real headache, either scheduling an appointment in workplaces or going from house to house and not finding anyone;
- Therefore, many interviews are conducted in public places, such as shopping centers or parks. There are even consumer studies that take advantage of these sites to conduct interviews or surveys and give incentives, gifts, and coupons. In short, there are great opportunities for online research in shopping centers; and
- Among the advantages of conducting these types of interviews is that the respondents will have more fresh information if the interview is conducted in context and appropriate stimuli, so that researchers can have data from their experience at the scene of the events, immediately and first hand. The interviewer can use an online survey through a mobile device that will facilitate the entire process.

Telephonic Interviews

Telephonic interviews are widely used and easy to combine with online surveys to carry out research effectively.

Advantages

- To find the interviewees it is enough to have their telephone numbers on hand;
- They are usually lower in cost;
- The information is collected quickly; and
- Having a personal contact can clarify doubts or give more details.

Disadvantages

- Many times, researchers observe that people do not answer phone calls because it is an unknown number for the respondent, or they changed their place of residence and the researcher cannot locate it, which causes bias in the interview;
- Interviewees also do not respond and resort to pretexts that they are busy to answer, are sick, do not have the authority to answer the questions asked, have no interest in answering or are afraid of putting their security at risk; and
- One of the aspects that should be taken care of in these types of interviews is the kindness with which the interviewers address the respondents, to get them to cooperate more easily. Good communication is vital for the generation of better answers.

Email or Web Page Interviews

Online research is growing more and more because consumers are migrating to a more virtual world, and it is best for each researcher to adapt to this change. The increase in people with Internet access has made it popular, so interviews via email or web page stand out among the types of interviews most used today. More and more consumers are turning to online shopping, which is why these are great to carry out an interview that will generate information for the correct decision-making (Cohen et al., 2013).

Advantages of email surveys

- Speed in obtaining data;
- The respondents respond according to their time, at the time they want and in their space;
- Online surveys can be mixed with other research methods. They can perfectly complement and pay for the project; and
- A researcher can use a variety of questions, logics, create graphs and reports immediately.

Undoubtedly, the objective of the research will set the pattern of types of interviews best for data collection. Based on the research design, a researcher can plan and test the questions (Creswell, 2013).

Six (6) Grade 12 educators teaching Tourism, Life Sciences, Economics, languages, Mathematics and Physical Sciences were interviewed. Respondents were given an interview guide by the researcher which contained questions, and they were expected to answer further than what was asked.

These questions were designed to explore views of teachers regarding the integration of environmental education into Grade 12 curriculum. The semi-structured interviews allowed the researcher to probe and clarify responses that were not clear. Semi-structured interviews also enabled the respondents to express their views freely and not be confined by the drawn interview guide. The researcher was able to read facial expressions of the respondents through which she was able to probe more questions on their perceptions of the integration of EE into the Grade 12 curriculum.

The study adopted in-depth interview method to probe further to get more information from respondents. The use of an in-depth qualitative interview was considered the appropriate format for this study research because in-depth questions cannot be answered briefly.

Johnson and Turner (2003) and Smith et al. (2009) indicated that in-depth interviews help the researcher to probe further to bring clarity on the study. The study sought to find out teacher's perception on EE integration across-curricular; it is, therefore, imperative for the researcher to engage the respondents in more detailed interviews to collect credible data. Therefore, the choice of in-depth interviews was relevant for the study.

In view of in-depth interviews, the researcher adopted interview guide approach. Johnson et al. (2003) describes this approach as where the topic for the interview is pre-specified and listed on an interview protocol. However, the researcher is not restricted to follow the questioning sequentially, and the wording can be re-framed to cover more information for the study. The researcher conducted the interviews in a coherent atmosphere, and interview questions were rephrased to ascertain credible data from respondents. Questions were redirected to probe further on respondents' understanding, views and beliefs of EE integration into their respective subject areas.

3.7 DATA ANALYSIS

Data analysis is the process of providing understanding, sense and meaningful ideas out from the data collected in a research study (Cohen et al., 2013). Before the interview guide was given, the respondents were briefed on the nature of the study, expectations and the responsibility of the researcher (Patten & Newhart, 2017).

The data for this qualitative study was collected through in-depth interviews. Inductive analysis style was adopted to analyse the data. This is a process through which researchers create meaning out of data collected through specific guidelines. In addition, the process of analysing using the inductive style is a "systematic process of coding, categorising and interpreting data to provide explanations of a single phenomenon of interest" (McMillan et al, 2010:367).

3.7.1 Inductive style

According to Grbich (2012), inductive approach starts with in depth observations of the world, which focuses on abstract generalisations and ideas. In this approach the researcher, develop empirical generalisations and identify preliminary relationships as the research progresses. No hypotheses can be found at the initial stages of the study and the researcher is not sure about the type and nature of the research findings until the study is completed.

3.7.2 The process of inductive coding

Inductive coding starts with attentive readings of text and generating meaning from the text. The researcher identifies text categories that contain meaningful units and creates a label for a new category into which the text segment is assigned (Thomas, 2006). According to Thomas (2006), the following procedures are used for inductive analysis of qualitative data:

(a) Preparation of raw data files: This is the stage of data cleaning. The researcher sets up raw data files in common categories; for example, interviewer's comments highlighted during the interview process. Documents are printed out with a backup of each raw data file of interview transcripts;

(b) Researchers read text vividly. Once text has been prepared, the raw text should be read in detail so the researcher is aware of the content and derives an understanding of the themes embedded in the text;

(c) Creation of categories: The researcher identifies different themes from different perspectives according to the data collected. These emanate from the research aims and objectives;

(d) Overlapping coding and uncoded text: According to Thomas (2006), there are two different categories of coding in qualitative research and these include one segment into one or more categorisation and non-categorisation of text or data irrelevant to research aims and objectives; and

(e) Lastly, Thomas (2006) argued that there should be constant and continuous revision of categories. This will help to identify subtopics and contradictory views from respondents and select relevant themes that will be useful to the study.

The process of analysing the data is systematic. Firstly, interviews are conducted and then transcribed to produce data for analysis. Transcription entails taking data or narrative from recorded device and converting this to a written document (Grbich, 2012). Transcription relates to converting oral speech to written text. The procedure for transcribing data was done manually to capture views expressed by the respondents to make data more credible and reliable according to themes that emanate from the data collected (Kvale, 1996).

Patton (2005) indicated that data collected in a qualitative study is arranged and organised in sequential order. These categories focus on critical views and data that represents the research aims and objectives. The researcher classified data in this qualitative study under the following themes or groups:

(a) Logistical details about the study;

(b) Categorisation of data;

(c) Interpretation of single instances;

(d) Identification of patterns; and

(e) Synthesis and generalization.

3.8 DATA TRUSTWORTHINESS

To enhance data trustworthiness, the researcher adopted three distinctive strategies namely, member-checking, prolonged and persistent fieldwork and mechanically recorded data.

3.8.1 Member checking strategy

McMillan et al. (2010) described this approach as when the researcher crosschecks data from the respondents to ensure accuracy during data collection. In this study, the researcher verified the authenticity of data obtained from the field by visiting the respondents for them to crosscheck if the data reflects their opinion as expressed in the interview conducted. Interview questions were rephrased and probed consistently to obtain more credible data. In member checking, respondents were asked to edit and verify the data collected. They were offered the opportunity to delete any narrative that does represent their views.

3.8.2 Prolonged and persistent fieldwork strategy

Loubser (2005) indicated that fieldwork is an important part of qualitative study. The term 'field' simply refers to where the phenomenon to be researched exists in its naturalistic setting. According to McMillan et al. (2010), prolonged and persistent fieldwork is whereby the researcher conducts interviews in the respondents' natural setting to reflect their lived experiences. It allows provisional data analysis, earliest comparison and corroboration to ensure a match between the findings obtained and the respondent's reality.

The researcher conducted interviews at the identified school, where the phenomenon for the study exists.

3.8.3 Mechanically recorded data

Depending on the tape-recorded transcription accuracy when collecting data during interviews and after interviews, much time is spent with the respondents to validate their responses, which makes the data more valid and reliable.

3.9 ETHICAL CONSIDERATIONS

According to (Lichtman, 2013), ethics of research mean taking precautionary measures to protect respondents from harm. Any credible and scientific study should adhere to research ethics. Ethics is acting morally when engaging participants (McMillan & Schumacher, 2010). Dealing with respondents at the field have many serious moral and professional implications.

However, the success of this study largely depended on the respondents' lived experiences. The instrument for collecting data was mainly in-depth interviews with respondents. In view of ethical concerns, the study adhered to the following research ethics to protect the respondents for this study:

3.9.1 Informed Consent

Respondents or participants in any scientific study are entitled to information about the study. The burden of making the respondents aware and well informed about the study lies on the researcher (Lichtman, 2013). Although the researcher cannot describe the direction of the study at the field, it is the researcher's responsibility to ensure that all respondents do understand their role and participation in the study.

In light of this, the researcher of this study made conscious effort to inform all participants about the nature of the study. This was done by giving out informed consent forms to all respondents. The details in the form were well interpreted and explained to all respondents for them to make informed decisions on whether to participate or not. Their willingness was indicated by a signature on the informed consent form.

3.9.2 Confidentiality and Anonymity

An individual participating in a research study should have adequate security and privacy guaranteed by the researcher (Lichtman, 2013). In this study, the researcher took adequate steps to ensure that there is no breach of privacy. The researcher removed all identifiable information from the records of the study. Permission was sought from respondents to disclose certain findings in public. In addition to this, the research was sensitive to information received from the respondents in the field, and all data collected were treated as confidential. The researcher maintained anonymity throughout the study.

3.9.3 Voluntary participation

Respondents' involvement in a research study should be at their own volition. Offering money or any kind of undue inducement for research participation shall compromise the voluntary nature of their informed consent. Any undue influence shall distort the judgement of potential respondents (Grady, 2001).

The researcher duly informed all respondents about their rights of participation in this study. Respondents were not to participate in this study and admission was done voluntarily without any form of coercion. Respondents reserved the right to pull out at any stage of the study.

3.9.3 Data analysis

Researchers are to analyse data in a manner devoid of misinterpretations and fraudulent analysis (Lichtman, 2013). In this study, the researcher interpreted data collected from the field accurately without distorting or falsifying the views of respondents, which brought decorum and decency in the data collected.

3.10 CONCLUSION

In this chapter the researcher, discussed, research approach (qualitative), research paradigm(interpretivism), research design (Phenomenology), sample and sample techniques and lastly the strategy used in the collection of data. The analysis of this data and presentation will be shown in the next chapter, chapter four.

CHAPTER FOUR

DATA ANALYSIS AND PRESENTATION

4.0 INTRODUCTION

This chapter centres on presentation, analysis and interpretation of the main findings of the study. The intent of the research study was to respond to the main research question, to determine teachers' perception of EE integration into Grade 12 curriculum in one public high school in the East London Education District.

The respondents in this study were six teachers in the FET phase in one high school at Mdantsane Township. All the six (6) selected teachers were teachers at the FET band specifically Grade 12. Throughout the interview process, field notes were taken by the researcher, and a tape recorder was used to record the responses of respondents. The researcher used a tape recorder to verify, edit and analyse the responses of respondents at the later stage of the study. The tape-recorded data was then transcribed into written text.

The data of this qualitative study was solicited from six (6) respondents who actively and willingly responded to semi-structured in-depth interview questions. The chapter is structured as follows: the background of the sampled school; biographical factors of the respondents; presentation and analysis of the data gathered through interviews; presentation of the data collected through document analysis and the Conclusion.

4.1 THE BACKGROUND OF THE SAMPLED SCHOOL

The public high school in which the research study was conducted is located in the Mdantsane Township in the East London Education District. The historic narrative indicates that the high school in which the research study was carried out was established about four decades ago. The school boasts of many prominent past students excelling in different spheres of life. The majority of educators working at school have occupied their permanent post over decades. It is estimated that the

school has a student population of over 700 hundred learners, with two (2) grade twelve (12) classes.

The school has an administration office that houses the school Principal and admin clerks. The office is between two classrooms, which inconvenience the admin offices. It is interesting to know that, there is no proper staff room for educators. A classroom has been converted into a staffroom, and other teachers are using the schools under resourced school laboratory as their staff room. Inadequate classrooms have resulted in overcrowded classroom, which directly affects the quality of teaching and learning at the school. Five out of six respondents alluded to the fact that, classroom control and management is a major setback during instructional hours due to congestion.

The ablution facilities in the school need a huge facelift. Both boys' and girls' toilet facilities need complete renovation. There are few toilets working that serve over 700 learners. Poor sanitation at the school is a major concern that requires urgent attention. There are insufficient dustbins, and this makes learners to litter in the school compound and polluting the environment. The school is fenced with wire mesh, with the main gate manned by the school caretaker.

The school is situated in an underprivileged community, and most learners come from poor homes. Information available to the researcher indicates that the school falls under a no-fees school. Under the government initiative and public school Act 84 of 1996, the school falls under quintile one. Quintile one means free school fees for learners from poor backgrounds while quintile five falls under the category of learners whose parents can afford to pay school fees (DOE, 2000).

Learners under quintile one category receive free textbooks, stationery and free lunch at school through government support. This community-based school is surrounded by informal settlements, and most learners live either with a single parent or grandmother, and their only source of income is the child grant or old age pension grant. Most people in the community are unemployment, and house breaking and other nefarious activities increasingly affect the community members. Teachers are often robbed of their possessions on their way to and from school. Information picked out from the interview reveals that the school itself has been a target on numerous

occasions where thieves stole desktop computers from the school a week prior to conducting this research study.

4.2 OVERVIEW OF RESPONDENT'S PROFILE

The researcher purposefully selected respondents deemed useful to the study. The six respondents comprised two females and four males, who are all qualified teachers at the FET phase. The researcher sought to establish teacher's perceptions on the integration of EE into their respective subject areas of speciality. The table below illustrates the summary of the respondents' background.

Table 4.1 Summary of respondents' profiles

No. Respondents	**1**	**2**	**3**	**4**	**5**	**6**
Age	**53**	**47**	**49**	**50**	**51**	**52**
Years in Services	**25**	**12**	**17**	**22**	**19**	**18**
Subject Area	**English FAL/ GEO**	**MATHS**	**LIFE SCIENCES**	**PHYSICAL SCIENCES**	**ECONOMICS**	**BUSINESS STUDIES/ L.O**
Grade taught	**10-12**	**10-12**	**10-12**	**11-12**	**10-12**	**10 – 12**

The above table 4.1 illustrates the summary of six (6) qualified respondents who actively participated in this research study. The six respondents who were purposely selected are teachers with vast experience in their subject areas of speciality. Respondent 1 and 2 are both females whereas respondents 2 to 6 are all males.
Respondent 1 has been teaching in the research site for almost 20 years with vast knowledge on both the old and new curriculum. This respondent started her teaching from a nearby school within the same vicinity with outstandingly high matric pass rate over a decade. Respondent 2 is the youngest among the respondents with 12 years teaching experience in Mathematics at the FET phase. Her passion for teaching Mathematics is commendable. She has been teaching at the present post for the past 5 years with incredible matric results in Mathematics.

Respondent 3 has taught Life sciences for the past 17 years at the FET phase. This respondent with such rich experience has been teaching in the FET phase since the beginning of his teaching career and had being teaching at the research site for the past 10 years with exceptional Matric pass rate in 2018 and in the past years. Respondent 4 has vast experience in the teaching of Physical Sciences in the past 22 years and has taught in the present post for the past 12 years. The zeal and passion of the respondent is highly commendable.

The information provided in the above table indicates that the researcher purposefully selected respondents who are well experienced in their respective subjects. They all have rich experience on both the old and new CAPS curriculum. Therefore, their perceptions with regards EE integration were useful to this study. It is important to know whether EE integration into subject areas has any gender connotation. The genders of respondents are discussed below.

4.3 THE GENDER OF THE RESPONDENTS

Six (6) respondents were interviewed in this study. Two out of the six respondents were females and other four were males with long standing experience. It was of great importance to the researcher to ascertain if gender has any influence on the Integration of EE into the Grade curriculum at the FET phase. This is reflected in the table below:

Table 4.2 Gender of the educators who were interviewed for the research study.

RESPONDENT(S)	GENDER
ONE	FEMALE
TWO	FEMALE
THREE	MALE
FOUR	MALE
FIVE	MALE
SIX	MALE

4.3 QUALIFICATIONS AND EXPERIENCES OF THE RESPONDENTS

The norms and standards in employing teachers in public schools, as set out by the Department of Basic Education (DOE), required that, all teachers be fully registered with South African Council of Educators (SACE). The basic entry qualification as a teacher is a Diploma in Education or a four (4) year Bachelor's degree in Education. Those who have a non-education degree are deemed unqualified teachers unless they upgrade by enrolling for a certificate qualification in Education (PGCE) with specialisation in one or more teaching subjects. The qualifications of teachers were important to the researcher because teachers' levels of professionalism contribute immensely to the aims and objectives of the study. The researcher analysed qualifications of respondents to ascertain whether respondents are well qualified and experienced to teach their respective subjects. The table below illustrates professional qualifications of respondents who were interviewed in this study:

Table 4:3: An overview of professional qualifications and years of experience of the respondents in the research study.

RESPONDENT(S)	QUALIFICATION(S)	WORK EXPERIENCE
One	STD, HDE, ACE, B.ED	25
Two	B.ED, HONS	12
Three	BSc, PGCE	17
Four	BSc, ACE	22
Five	STD, HDE, BCOM	19
Six	BA, ACE	18

The above table indicates that all respondents were qualified to teach in South African public schools. All the six respondents have degree qualifications and other relevant career qualifications. All respondents meet the basic qualifications, as set out by the norms and standards of Department of Basic Education (DOE) and South African Council of Educators (SACE). This implies that all respondents are fully accredited as teachers in the Republic of South Africa.

4.3.1 Presentation and Analysis of Data Gathered Through Semi-Structured Interviews

The intent of this research study was to explore teachers' perceptions on the integration of environmental education into Grade 12 curriculum. In this chapter, the findings of the research are discussed according to the main research question (What are teachers' perception of the integration of environmental education into the Grade 12 curriculum?). This is also according to the sub-research questions

The researcher used the phenomenological data analysis approach to analyse the data. In research questions, the concept of teachers' awareness of EE, teachers' understanding of EE integration, how teachers integrate EE into their respective subjects, the importance of EE integration and challenges faced by teachers in EE integration were analysed. They were also categorised based on commonality and differences of respondents' statements recorded during the data collection process. The results of the research study are presented below.

4.3.2 Teachers' Awareness of EE Integration in the School Curriculum

The present South African school curriculum (CAPS) has integrated EE into all school subjects from GET phase to FET phase, respectively, instead of teaching EE as a stand-alone subject (DOE, 2011). This has made the teaching of EE a shared or collective responsibility of all school teachers.

EE has been incorporated into content arrears of other traditional subjects at the school level. It is believed that through integration, teaching and learning shall adopt a holistic approach to integrate EE to real life situations, thus making learners to be informed about environmental issues.

Integration of EE is a laudable concept and the aspirations could only be a reality, if teachers who are field workers and direct implementers of the curriculum are fully cognisance of its presence in their respective subject areas. In order to establish teachers' awareness of EE integration, the respondents were asked if they were aware of EE integration into their subjects. The responses from respondents were varied from subject to subject.

Firstly, respondents were asked: "do you have any idea of the integration of environmental education into other subjects? If yes, what is your understanding of the integration?" The purpose of asking this question was to ascertain whether

teachers are fully aware of EE integration as imbedded into the school curriculum and to establish a clear picture of their understanding of curriculum integration.

In finding answers to the question, the responses received from six (6) respondents were categorised into two, namely, those who are aware of EE integration into their subjects and those who are uncertain of EE integration. The results of the findings are discussed below.

4.3.2.1 Integrated into subjects

Four (4) out of the six (6) respondents indicated that they are aware of the existence of EE integration in their respective subject areas. Teachers who are cognisant of EE integration focused on EE as an integrated content component and as a teaching and learning resources.

In categorisation of the teacher's awareness of EE integration, teachers who were fully aware of EE as an integrated component into traditional subjects viewed EE as a subject matter integrated into their subject content area and relates to environment. Their opinion about subject matter integration points to an exact topic that needs to be taught in a specific subject.

One of the respondents in this category affirm that EE is integrated as a component in the content areas of their respective subjects. The statement made *verbatim* (unedited) below by respondent 5 alluded to the fact that, the teacher is aware of EE integration.

> *In economics of Grade 12 curriculum some of the topics are environmental related. "These topics include, globalisation, environmental deterioration, Environmental sustainability and I always tried as much as I could to link up the content areas of such topics to the environment for learners to get a clear picture of the happenings in their immediate environs" (Respondent 5).*

When the Life Sciences teacher was asked if he is aware of EE integration in his subject area, he listed the following topics as areas covered by environmental issues (verbatim).

> *"In life science of the FET curriculum, some of the environmentally related topics are: Responding to be environment (humans), Responding to the Environment (plants), Human impact on the environment: current crises, any time I reach this particular chapter according to my pacesetter is always*

exciting as learners are anxious to more about the environment. However, these topics are mostly dealt with in the lower Grades. In Grade 10 and 11 respectively, not much is said about the environment in the Grade 12 curriculum which is the exit grade of the FET phase"

The researcher asked the Physical Sciences teacher if he is aware of the existence of EE in his subject area. He respondent by saying:

"Mmmh yes I think so because there are topics like Organic Molecules, Organic molecules as molecules containing carbon atoms, carbon as the basic building block of organic compounds that recycles through the earth's air, water, So Soil and living organisms, including human beings, Conservation of energy with non-conservative forces present, Electrical machines (generators, motors), Photoelectric effect. Link to the harnessing of solar energy, which are all environmentally related, with my long standing experience as a teacher, I always try to relate such chapters to the environment"

The Geography teacher who coupled as English FAL teacher. When asked about her awareness of EE in her subject, she said:

"My subject is environmentally biased and gives clear definition on how to handle EE based topics without any hassles". These topics were listed as chapters which run through the FET phase Geography curriculum. Geographical skills and techniques: topographic maps, GIS, synoptic weather maps: Climate and weather: cyclones, local climate, Geomorphology: drainage systems and fluvial processes, Rural and urban settlement, Economic geography of South Africa. " I see geography as purely EE since the focal point is on the environment, unfortunately only few Grade 12 learners are doing the subject" (Respondent 1).

The opinions shared by teachers under this category of awareness of EE integration show that EE themes and topics are well integrated into the content areas of all science related subjects and mostly, Geography. Teachers teach EE-related topics as part of the content of their respective subject area of speciality. Looking at the responses of the interview above, EE is well integrated in these subjects with specific guidelines.

4.4 EE AS TEACHING AND LEARNING MATERIAL

Some respondents' inputs during the interview suggest that they are aware of EE and integrated it as teaching and learning material and not in content area. These include use of pictures, objects etc. to depict the environment. Respondent 1 said:

> *"Err, mhmm, indeed! I am aware of EE integration but I only integrated EE themes into my activities as teaching and learning materials which are environmentally related like pictures, maps, pictures of environmental degradation, because there is no specific topic in English FAL that is geared toward the teaching of EE".*

When the question was rephrased and probed further, the respondent indicated that:

> *"I also see EE mostly in the teaching of grammar and construction of sentences. I do this by formulating sentences with environmental themes. Some of text and cartoons used in FAL are environmentally related. Sometimes I give reading materials to my learners and these comprehension passages has environmental themes integrated in them. I also take learners out of the classroom sometimes to the school field"*

When respondent 2, the Mathematics teacher, was asked about her awareness of EE in the Mathematics curriculum, she said:

> "*There is no specific topic in Mathematics that directly addresses EE. However, in Mathematics, we have topics like Geometry statistics and Interpretation of data that are have environmental themes. In measurement, calculation of surface area, perimeter, sometimes they have environmental themes in my opinion. I use EE themes in making illustrations in content areas, therefore it serves as teaching and learning material or resources. In data collection in statistics from Grade 10 to 12 curriculum the content is mostly about real life issues which includes EE. It is sometimes hectic linking up environmental content in Mathematics because there is no proper guideline on to how to integrate EE into any Mathematics chapter. The onus rests on the teacher to think deeply on to incorporate EE themes into the content and it is unfortunate I don't think all teachers would have the skill and ability to do. In Grade 12 curriculum we have10 chapters that need to be covered in order to prepare learners for matric examinations. Therefore, the pressure of finishing syllabus of Mathematics makes it quite challenging to integrate EE themes".*

Views shared by respondents indicate teachers' perceptions concerning EE integration into their subject areas. The interview notes revealed that the method of integration adopted by the South African curriculum is not yielding the anticipated results. Teachers find it extremely difficult to incorporate EE content into their subject content areas as most teachers struggle to link EE content to traditional subjects. Those teaching sciences and Geography have less worry about EE integration since EE content already exists in these subjects and such content is examinable as required by the curriculum. Some teachers indicated that they were unaware of EE integration as discussed below.

4.3.2.2 Unaware of integration into subjects

Some of the respondents interviewed revealed that EE is not part of their syllabus coverage. The response is categorised under this section for analysis. This section highlights teachers who stated emphatically that there is no EE integration in the subject area.

The teachers consistently admitted that there is no EE content into their subjects and perhaps they are not aware of the development. The uncertainty on the part of the teachers revealed serious concerns on the implementation of the new CAPS document. The respondent stated that they have not seen any EE topics in their syllabus, hence the question of EE integration is new to them; no department official has told them to do so. There no workshop organised by the Department of education, to mentor teachers on the integration of EE.

When the researcher asked respondent 6 about his knowledge of EE integration into Business studies, he said;

> *"Hayibo! is this another syllabus after CAPS? I don't have any clue about this sir".* The researcher then rephrased the question and probed further. The researcher then asked if he is aware that teachers need to teach EE in their respective subjects, *he said "I have taught my subject for nearly 18 years and I have not seen any environmental education topics in my subject area. I am trained to teach Business studies not EE, hmmm. I don't even know how it is possible to teach two different subjects at same time".*

The researcher then asked if he is aware of topics like Human rights, inclusivity and environmental issues, the extent to which a business venture addresses issues such as human rights, inclusivity and environmental issues in Business studies at the FET phase. The responded had this to say:

> *"Yes I know these topics and I have been teaching them".* The researcher then probed further by asking the respondent if he is aware that, the above listed topics have environmental themes, and he said: *"I see these topics as Business studies topics and not as EE".*

Respondent 2, who is Mathematics teacher, initially stated that there is no EE topic in Mathematics.

> *"I am yet to see any EE Chapter in Mathematics. I am not aware of EE in my subject, forgive me if I sound naïve"*

The responses given by various teachers suggest that most are not conversant with EE integration into their traditional subjects. There are many environmentally related chapters in most subjects but since there is no clear definition and guidelines of EE topics, teachers battle to identify them.

On the other side, teachers teaching science related subjects and Geography find it extremely easy to integrate EE into their teaching subjects. Most respondents are not comfortable with EE integration into their teaching. According to them, there is no policy guideline on how to integrate EE. This creates a challenge to identify what topic requires integration and vice versa. The level of despondence exhibited by respondents prompted the researcher to probe further. This is discussed below.

4.4 TEACHERS' UNDERSTANDING OF EE INTEGRATION IN THE SCHOOL CURRICULUM

The second research question investigated teachers' understanding of EE and its integration in the school curriculum thereof. It is of great importance to know teachers' understanding of the environment as this may influence EE integration into the school curriculum.

In seeking teachers' understanding, respondents were asked to explain the meaning of EE before looking at EE integration in the school curriculum. They gave varied views of their understanding of EE. Analysis of data collected shows that teachers

who are the frontiers of EE implementation do not have in-depth knowledge about the environment and EE. The results of the interview are discussed below.

What is your understanding of the environment? (Researcher). Respondents explained the environment as

> *"Is the total of all the physical things that surround us."* (Respondent, 1).
>
> *"It is all the things that are around human being like animals, insects, plants - the things on the ground."* (Respondent, 2).

The description given by respondents shows how teachers perceive the environment. The various explanations given by various teachers excluded man as part of the environment. They all described the environment as human surroundings while alienating man from the environment.

Other studies conducted has revealed that, human beings in an effort to define environment end up separating man from the environment, forgetting that man is part of the environment (kimaryo, 2011). The researcher then asked the respondents: "are you aware man is part of the environment?" These were the responses given by respondents

> "*Mmh I think man is part of the environment because human beings are also living things" (Respondent, 6). "The environment consists of both living and none living things, in my view human beings are livings things and therefore form part of the environment*" (Respondent, 4).

When the question was posed to the Life Sciences teacher, he gave his view based on his scientific knowledge and said:

> *"The environment is the surrounding or conditions in which a person, animal, or plant lives or lives. You can see from my explanation that there is an inclusion human element factored in my view. We are part of the environment and it is our sole responsibility to sustain the environment for the next generation. We destroy or improve the nature of the environment through our human activities"* (Respondent, 3).

The researcher posed same question to last respondent, and he had this to say"

The environment is a vacuum of space occupied by mankind, living things and non-living things".

This implies that the environment is a setting for humankind where human lives on a daily basis. This setting includes buildings, rivers, lakes, school and other things that support human life. Others perceived the environment as a setting that is socially motivated. The respondent classified the social setting as political and cultural systems that influence human behaviour and attitude towards the environment.

The researcher then asked respondents about their understanding of EE. The explanation given by most classifies EE as knowledge-based. In the context of this interview, knowledge refers to the acquisition of concepts that influence human thinking toward the environment. Respondents based their argument on EE as education about the environment and education about caring for the environment.
Four (4) out of the six (6) respondents described EE as education centred on the environment.

This explanation was concerned with the cognitive and awareness aspect of the EE and sustainability of human lives. One respondent said:

"EE is an education which influences a person's life, indirectly teaches the how to live in their environment and sustain the environment for the next generation".

Interestingly, another respondent also said:

"Environmental education is an education offered to people in other to know the climatic conditions of a given place in order to live comfortably".

Others also suggested that EE is education that creates environmental awareness and makes people environmentally literate to protect and preserve available natural resources. Other respondents said that EE is a tool to equip learners with the ability to solve environmental problems in their communities. Respondents believe that EE is about giving learners environmental knowledge to solve environmental problems. Respondent 4 and 6 said:

"It is a skill given to learners in order to deal with environmental problems both at school and their immediate environs. Some of these problems include degradation, pollution, erosion, drought etc."

The respondent added:

"There is scarcity of water these days because of human activities. Therefore, with the help of EE, some of these problems could be solved through shaping the attitude of humans toward the available natural resources".

All the explanations extracted from the interviews allude to problem-solving skills. They all thought that EE is about giving skills to individuals to solve environmental problems.

Human survival on this planet largely depends on our ability to sustain the available natural resources. Effective utilisation of available resources means individuals are managers of natural resources, and it is our collective responsibility to ensure that, the resources are well taken care of. An extract from an interview said:

"I think EE centres on the usage of natural resources and the benefit we drive from the environment."

On the hinge side of political motivation, respondents believe that, the political terrain influences and shapes attitudes towards the environment through the enactment of laws, policies and rules and regulations which safeguard the environment. Some of the views extracted from the interview illustrate the thinking of teachers in this direction. Do you think that political influence helps in the protection of the environment as a teacher?

"I am not a politician but I shall try to answer you according to my understanding. In my opinion I think political systems enact laws, rules and regulations in the country so I think these rules directly or indirectly shapes individuals' attitude toward the environment. For instance, if the government make laws which prohibit littering on streets and other publics places,

offenders shall be punished accordingly. In conclusion, in my view political system could influence the behaviour of others".

Almost all respondents explained EE as education centralised on the environment. With the trend of responses, respondents were focused on the cognitive aspect of EE. One of the respondents was emphatic that mankind lives in the environment; therefore, its sustainability largely depends on man's ability to preserve the natural resource through acquisition of environmental knowledge.

It was also suggested by one of the respondents that education guides a person to make an informed decision on how to live in their environment comfortably, depending on their current situation at a particular place at a given time. Others suggested that, knowledge about the environment is very crucial since there are many dangerous objects in the environment. It is, therefore, imperative to have much knowledge about the environment to guarantee human security. A respondent further added that, it is better to understand what EE is about.

Another teacher talked about knowledge of the environment in terms of security. He argued that some of the objects in the environment are dangerous. Therefore, he says, that if we understand the nature of the environment, we shall know the dangers to human existence. The researcher went further to seek respondents' understanding of EE integration into their respective subjects. What is your view on EE integration into your subject (Researcher)?

"Mmmh, you mean teaching environment together with my subject? Hahaha there is nothing, you know, what the workload in my subject is way too much and combining two subjects which I have not done before is not workable" (Respondent, 1).

"I think when you talked about EE integration to my subject, it's all about adding EE content into my subject content, and seriously speaking I have no idea on how to do this by teaching two things at the same time" (Respondent, 6).

"Integration I think when one thing is infused into the other one" (Respondent, 3).

Other respondents gave varied views, which suggest that, most do not understand the concept of EE integration. Conflicting views shared by respondents raise serious concerns about how EE is integrated in the current CAPS document at schools. The next section discusses how teachers integrate EE into their respective subject areas.

4.5 HOW TEACHERS INTEGRATE EE INTO THEIR RESPECTIVE SUBJECTS

The third research question investigated how teachers integrate EE into their respective subjects. Besides investigating teachers' understanding of EE, it was noteworthy to investigate how teachers incorporate EE into their traditional subject content areas of speciality. The researcher urged teachers to share their experiences on how they teach EE in their subjects. From the responses, it was clear that there is no common structure in how teachers incorporate EE into their subject areas. There are different approaches that vary from one subject to another. In the discussion, some teachers said they integrate EE as subject content and others said they integrate EE into their subject as teaching and learning material.

Some respondents admitted that, they integrate EE at content level. The main objective is to impact the requisite knowledge to the learners. This implies that, the EE content exists already in the traditional subject content. Therefore, teaching subject content indirectly also achieves the purpose of teaching EE. Subject topics have specific subtopics with EE elements.

Respondents teaching subjects like Geography, Life Sciences and Physical Sciences admitted that EE topics are well defined in the content area of the syllabus coverage, which makes it quite easy to incorporate them into their lesson delivery. Respondents teaching sciences said,

> *"In my subject area, there are specific topics with EE elements that I do not struggle to teach because these topics are examinable and it forms part of my syllabus coverage".*

The respondent teaching Geography said:

> *"My subject area is environmentally biased, so every content is centred on the environment. Topics like climatology, geomorphology and others are all environmental topics. I find it very easy to teach these topics because it is part of the curriculum and there is clear assessment instruction and guidelines on how to deliver lessons in a classroom".*

From the above discussion, the researcher concluded that, respondents teaching sciences and Geography find it easy to integrate to integrate EE into their subjects. These topics are not just integrated as themes but constitute mandatory topics prescribed by the curriculum and are examinable. With the zeal and understanding of these traditional topics, respondents are able to elaborate and teaching effectively by linking up with real life situations.

EE content integration into subject approach is adopted into subjects where environmental topics do not form part of the content area. In this scenario, EE contents are not well defined and stated clearly on the syllabus of those subjects. Most respondents admitted that, they only teach some themes of EE in their teaching whenever there is a need to do so. Respondents teaching English language, Economics, Business studies, Life Orientation and Mathematics admitted that there is no clear policy guideline on how to integrate EE into their subjects. They indicated that it is very difficult to find their own ways to integrate EE into their teaching. However, they try hard to integrate EE themes into their content area during teaching in the classroom because there is no specific chapter or topic in their subject that directly addresses environmental issues. These are some of the extracts from the interview. How to do you integrate EE into your teaching? (Researcher)

> *"Hmmm though it is a bit challenging I do try to integrate EE content into my teaching by relating the subject content with the environment. I do so by making practical examples in class using environmental contents in my illustration by linking up the content area with real life issues" (Respondent, 1).*

Another respondent said:

> *"I do incorporate EE into my lesson delivery by the inclusion of EE content into my teaching. For instance, I do make practical examples by linking up EE content into the subject content"* (Respondent, 6).

The other respondent teaching Mathematics had this to say:

> *"Honestly speaking it is very difficult to integrate EE content into Mathematics. How would you integrate EE content into topics like algebra, functions, sequence and series, Analytical geometry, Euclidean Geometry? But I do always try to integrate EE contents in teaching Mathematics in areas like statistics, application of calculus, three dimensions in trigonometry, and interpretation of graphs. For instance in data collection in statistics I always use data that relates to the environment. In application of calculus as the name implies is about linking calculus to real life issues by doing so I integrate EE into the content of Mathematics."*

The various explanations given by respondents on how they integrate EE as a component to their teaching subject indicate that every respondent is working tirelessly to link EE content to their subject content where EE is not stated explicitly in the subject syllabus. This way of integration requires analytical thinking and deductive reasoning to integrate EE content to subject content. This approach of integration is devoid of uniformity because each respondent derives their own means of EE integration into their subject content area.

Therefore, every respondent has his or her own style of integrating EE. Respondents indicated that, finding means to integrate EE content into your subject could affect your lesson delivery. Instructional time could be wasted if the integration is not well structured or planned. Interestingly, respondents admitted that teaching Grade 12 is entirely different from teaching the other Grades. Grade 12s are only concerned about content areas that have directly influence on their matric results. Therefore, unwarranted EE content integration may result to tediousness in the classroom.

Two respondents, namely English language and Mathematics teachers, indicated that they sometimes use EE content in their teaching to develop a specific skill in learners. They refer to skills as the capability of achieving something because of training. The respondent teaching English language said:

> *"I only integrate EE whenever I am teaching, lexis and structure, comprehension, compositions, poems. These help learners to acquire language skills. I always select a comprehension passages that relates to environment and contents specifically addresses environmental issue. I do analyse the content of these messages with learners and relate the environmental content to real life situation. In teaching vocabulary I always select environmentally related words like, pollution, erosion, deforestation, afforestation, climate change, ozone layers and many more".*

The respondent teaching Mathematics indicated that she only integrates EE content in specific content areas for learners to gain numeracy skills and the ability to do analytical thinking.

> *"In statistics in Grade 12 syllabus, I always use data that are related to the environment. This makes the lesson to be interesting and by doing so the learners acquire statistical knowledge and skills which shall not only help them to recall easily and pass their matric exams but also help them in their future endeavours especially those who may study statistics at university and others who shall opt to be quantitative researchers. Application of calculus is a bit of a challenge to many learners so I always use practical examples that relates to the environment which makes the lesson interesting by doing so a specific mathematical skill is develop through EE integration".*

Other respondents indicated that they do integrate EE content into their subject content but rather use EE as teaching and learning material or resources.

> *"I personally do not see any specific topic in my subject that defines EE content. The only way I try to integrate EE sometimes is by using teaching and learning materials which are environmentally related to explain specific concepts in the classroom. For instance, I use environmentally related pictures whenever I am teaching chapters like measurements and analytical*

geometry. My learners gain better understanding of the content and concept whenever I used EE in my content as teaching and learning resource. This makes the lesson to be more practical because it erases the notion of abstract teaching in the classroom" (Respondent, 2).

There were respondents who indicated that they integrate EE by using it as teaching and learning material.

"I sometimes integrate EE by using environment as a source of teaching and learning material. For instance in the teaching of statistics in Mathematics, I used charts and data with environmental elements as teaching aids to which help learners to understand the mathematical concepts easily because it makes the lessons more practical" (Respondent, 2).

Some respondents argued that, they integrate EE only as teaching and learning resources by improvising some of the things within their immediate environment as teaching aids. In this way, they believe they have integrated EE into their lesson. Importance of teaching EE is discussed below.

4.5 IMPORTANCE OF EE INTEGRATION INTO THE GRADE 12 CURRICULUM

The fourth research question investigated the importance of EE in the school curriculum. If teachers know the relevance of EE integration into the school curriculum, this may influence their attitude towards teaching of EE in their respective subject areas. Teachers were asked to explain the importance of teaching EE in the Grade 12 curriculum. Most of the explanations given by respondents centred on human development and empowerment.

Most respondents believe it is important to teach EE in the Grade 12 curriculum. Grade 12 is the final stream in the FET band of the Basic Education curriculum in South African education system. The phase prepares learners for tertiary education (DOE, 2011) and is the exit class of the FET band and a transitional phase to tertiary education.

The majority of respondents believe it is important to teach EE in the school curriculum, and the discussions were categorised into the EE as a tool to develop environmental knowledge and development of environmental skills in managing environmental problems. Other respondents' views were centred on development of understanding and positive attitudes towards caring of the environment and problem solving skills in dealing with environmental problems in communities. All the respondents assume that when learners are privy to environmental knowledge, it will directly translate into behavioural change.

Does the teaching of EE directly translate into positive attitudes towards the environment? This is shown known in further interviews with the respondents. The importance of the inclusion of EE into the South African school curriculum is to make learners environmentally literate (DOE, 2011). During the interviews, respondents used terminologies like "understanding of the environment, knowledge development and knowing about the environment". The respondents indicated that knowledge in this context refers to knowing exactly what the environment entails, what constitutes the environment, the importance of the environment and benefits humankind derive from the environment and building a positive relationship between man the environment.

All these create a conducive atmosphere for man to live with in the environment without endangering the available natural resources. Three respondents said:

> *"I think it is very important to teach EE. In my opinion irrespective of how EE is taught whether as a stand - alone or integrated component it shall help learners to have broad understanding of environmental issue and to be aware of environmental problems. I think if learners are environmental literate, they develop positive attitude toward the environment and help to solve basic environmental problems confronting their communities."* (Respondent, 4).

The second respondent had this to say when the researcher asked if it is important to integrate EE into school curriculum.

> *"Sir you and I live in this environment and it is our responsibility to know more about it. Therefore, it is very important to have EE as part of the school curriculum where learners shall acquire much knowledge about the*

environment, understand the environment where they live and address environmental problems."

The third respondent indicated that,

"It is very important to integrate EE into curriculum; we are living in an environment today confronted with many environmental problems for example global warming. Draught in South Africa especially at Western Cape Province. It was a serious natural disaster that resulted in a state of emergency at the province. All these disasters were motivated by human activities. Therefore, I think my opinion, the best and perfect way to deal with environmental issues is to be taught in schools irrespective of the approach adopted".

Further discussions with respondents indicated that it is to have EE integration into Grade 12 curriculum. They argued that it is very important to have EE integrated in the school curriculum. Learners should be fully knowledgeable about environmental problems, know what entails the environment and ways of solving environmental problem. This knowledge may be translated into their workplaces. Respondents emphasised that EE should be taught at the FET band in the Grade 12 curriculum. It was argued that it could deepen learners' understanding of their immediate environment and help many to cultivate the habit of conservation and acquire basic agricultural practices, which could be utilized after high school in a case a learner decides to go into farming.

Another respondent stated,

"I think teaching EE is very important. I believe so because the first thing everyone should be aware of is the environment. The environment constitutes lands, water, the air breath and other things with in the environment. It shall very suicidal for someone to complete his or her matric without knowing any about the environment. Grade 12 learners should be well equipped to deal with the unending global environmental problems confronting the world today. At the matric class, most of the learners are matured enough to take wise decisions. They have the ability to differentiate right from wrong. So think in facing the reality, Grade 12 curriculum should have more EE themes

integrated in all subjects with clear guidelines on how to teach such topics to depict EE depict EE in its context"

These statements made by teachers illustrate the practicality and applicability of utilizing EE knowledge after matric. The benefits of teaching EE at the Grade 12 level are priceless. From the discussions, respondents were emphatic that the knowledge gained through EE shall prepare Grade 12 learners to enter the job market where such knowledge and skills could be adopted into their future careers. In the era of land expropriation without compensation, many youth of today which to go into subsistence farming or commercial farming. Therefore,having environmental knowledge before completing high school shall add to their benefits, allowing them to start their own agricultural businesses to earn a living. Having acquired such environmental knowledge, learners shall take precautionary measures to ensure the environment is not degraded, polluted and wasted but utilized to benefit today and future generations.

In addition to the above discussion, other respondents indicated that EE develops positive attitudes towards the environment. In their view, acquisition of knowledge brings about behavioural change. If learners acquire environmental knowledge, it can influence their attitude toward the environment. These positive attitudes include caring for the environment, educating others about environmental problems and solving environmental problems in their immediate environs.

A respondent whose argument was based on a positive attitude said:

"I think it is very important to teach EE at schools, the future of the environment rest on the shoulders of our children. It is imperative to equip the future stewards of the environment with the requisite environmental knowledge. Even in the biblical context, it says: teach the child the way they should go and they shall not depart from it in their old age. As they grow up with environmental knowledge, they shall systematically develop positive behaviour and attitude towards the environment.As they grow up, environmental issues shall not be new to them and they might have developed environmental problem solving skills" (Respondent, 1).

Some of the respondents said EE helps learners to develop environmental conservational skills. It is believed that most environmental problems confronting the world today are self-inflicted, manmade problems. Most of these problems are created because of human activities. In the opinion of some respondents, the solution to these problems lies in the hands of man as mankind is the architect behind these problems. The respondent indicated,

> *"I think teaching of EE in the school curriculum is a step in the right direction, the ever-unending global environmental crisis requires drastic measures to solve these problems, the dignity of the environment need to be restored to their former state. Most of the ecological resources are depleted because of human activities and it may also take man to correct the wrongs of the past and rehabilitate the deplorable state of the environment. So I want to state categorically that, it is important to teach EE in school curriculum most especially in the Grade 12 curriculum because they shall have full knowledge on how to solve environmental problems and conserve the available natural resources".*

From the above discussion, it can be seen that, all respondents feel that EE should be incorporated into the Grade 12 curriculum. The collective decision identified from this interview was that EE in Grade 12 is very critical due the unending global environmental crisis. Learners in Grade 12 need to be taught EE in order to acquire skills and knowledge to solve environmental problems in our society. Respondents have the firm belief that knowledge that would be acquired shall be utilized effectively to solve the growing trend of environmental problems. Learners could have the skill to know and identify environmental problems and solve issues pertaining to the environment in order to maintain the quality of life.

Man is worthless without the environment; therefore, the sustainability of the environment rests on the shoulders of man. It is, therefore, crucial for learners to be taught EE to deal with environmental crises.

One of the respondents indicated that,

> *"It is important to teach EE at school because these children shall be role models in their communities"*

In this discussion, respondents were referring to learners living exemplary lives in their communities with respect to environmental issues. It is undeniable that, knowledge influences a person's behaviour and attitude. This behavioural change can be passed on to others within our immediate environs. Learners shall develop knowledge, skills and positive attitude towards the environment. These character traits shall not only shape the life of the learner but his or her entire community. In the era of technology advancement, learners could make a huge impact on changing attitudes of people through social media networks by sharing information that is environmentally related. An example is: sending pictures of degraded forests, of people affected by severe draught and how people could take conscious effort to address such issues.

Respondents indicated that, learners spread news faster than the adult population. Respondents admitted that it is very important to teach EE at school because knowledge acquired could easily be shared by learners in their communities. It is assumed that if the Grade 12 learners are taught properly in EE, they can transfer such knowledge to their peers and even help to spread the good news about the environment in their homes, to neighbours and friends on social media networks like whatsApp and Facebook. Through personal interaction with different people, learners would share the new things they have studied with regards to the environment. These are some of the extracts from the interview:

> "*I think it is good and very important to teach learners EE at school, most especially in the Grade 12 curriculum because knowledge acquired at school easily be shared at home and at their neighbourhood."*

> *"Yeah in my view, it is very important for EE to be taught at schools, learners could be used as an instrument to transmit knowledge to parents, neighbours and their communities at large".*

Another aspect raised during the interviews is that EE shall help to raise learners who shall be responsible citizens. An environmentally responsible citizen is an individual with the requisite knowledge, skills and attitude towards the environment and addressing environmental issues in their own small way. To be responsible is to care, protect and preserve the available natural resources from further degradation.

Responsible citizens are patriotic and shall defend and protect the environmental at all times.

Respondents emphasized that EE should be taught in the Grade 12 curriculum due to its enormous importance. These learners are future leaders of this great nation, and the future of the environment is on their shoulders. Therefore, it is very important for them to acquire environmental knowledge to develop skills to care for and protect the environment. Respondents argued that, if the nation needs good citizens, then children must be given quality education that includes EE. These were some of the extracts from the interview:

> *"In my opinion I think EE is very important because these learners are the very same people who shall take care of the environment in our absence.it therefore important for them to know much about the environment. Even after their matric, they shall still live with the knowledge acquired from EE, which shall make them to be responsible in the society by taking care of the natural resources."*

From the respondent's statements, it can be concluded that, it is very important to teach EE in schools. Respondents' views dwelt on the cognitive and affective development of learners. These aspects help learners to develop positive attitudes towards the environment. Respondents believe that when learners are equipped with the requisite knowledge, skills and attitude, they can be role models in the society.

This knowledge could be used in their future endeavours. If learners are well-endowed with a positive environment attitude, they can help in developing and mentoring others to adopt the same behaviour and understanding on how to care for the environment. With positive comments and numerous ideas shared during the interview, it could be seen that, respondents appreciate the integration of EE into their curriculum. They are willing to support the implementation of curriculum of integration into the school curriculum. However, teachers are confronted with many problems discharging their duties. This is discussed below in this study.

4.6 Challenges teachers face in the integration of EE into the curriculum

Most respondents interviewed in this study indicated that they teach EE in their respective subjects. They disclosed that, although idea of teaching EE as an integrated component is laudable and innovative, they are not integrating EE properly into their subjects, as prescribed by the CAPS document. Several factors impede the effectiveness of their work. These challenges include curriculum, teaching and learning factors and teacher-related issues. All factors hindering EE integration are illustrated diagrammatically below, and each factor is discussed in detail.

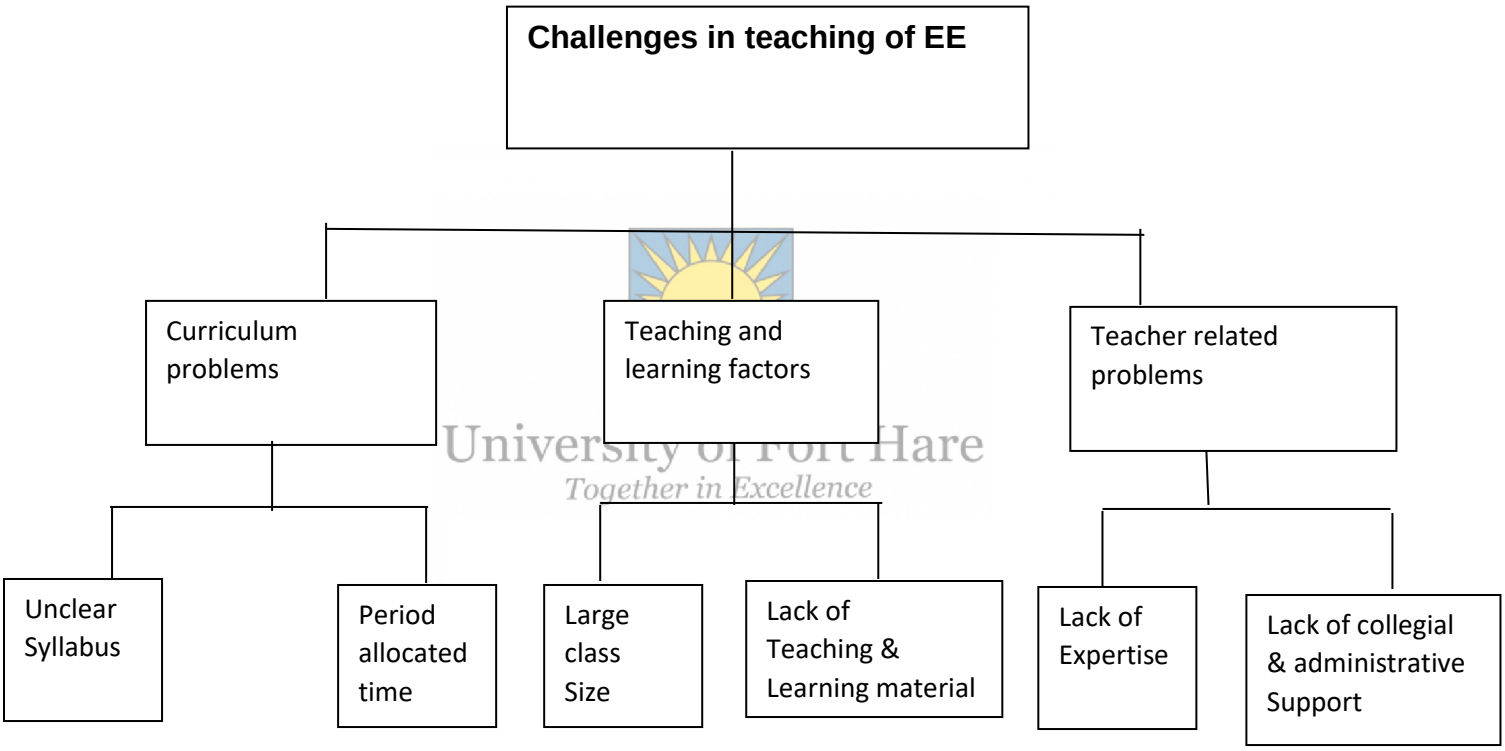


Figure 4.4 Challenges facing teachers in teaching EE as an integrated component adapted from (Kimaryo, 2011)

Curriculum Challenges

In this category, respondents indicated that the present curriculum is one of the factors affecting the implementation of EE. Their argument was based on the uncertainties and the unclear nature of the current CAPS document, subject syllabus and time allocation to each period.

All the respondents admitted that there is no clear interpretation on what needs to be integrated and how it should be integrated into the subject content. In fact, there is no policy guideline that suggests how EE should be integrated into subjects. This is a major issue threatening the teaching of EE in other subjects. What needs to be taught as an integrated component is not defined in detail by the syllabus.

The approach adopted by the CAPS document to incorporate EE into the curriculum is the integrated approach. In this approach, EE content or themes are incorporated into content areas of other traditional subjects like Mathematics, Languages and Economics etc., specifically at the FET phase of the South African curriculum (DOE, 2011). The syllabus of any subject serves as a guideline for any teacher. It directs and limits what need to be taught in a specific chapter. The concepts of each topic or chapter are clearly stated and defined for subject teachers follow.

With the emergence of EE as an integrated component into other traditional subjects, teaching of EE has now become a collective responsibility for all teachers, irrespective of their subject area of specialisation. The intention behind the introduction of EE as an integrated component is highly commended. However, in practice, subject teachers at the FET phase struggle to implement the idea of integration into their subject content. The integrated component is not specified in the syllabus. This hinders the advancement and the implementation of EE. Most respondents concluded that, they do not know of any environmental content to integrate into their subjects. These are some the verbatim excerpts from the interview:

> ***"****I have been teaching Mathematics for year, but I have a serious challenge on how to integrate EE content into my topic. I have taken my time to peruse the syllabus entirely and there is now in the syllabus that specifies the integration of EE content. I am willing to teach it but I don't know to go about it as a teacher and am being honest and sincere"* (Respondent, 2).

> *"I have difficulty in trying to integrate EE content into my subject. I have taught English language for years on passages for comprehension with environmental content. Unfortunately, the syllabus does not spell out what I need to stress on in my teaching, the idea of integration is fantastic but in practice is dead on arrival. I personally do not know what skills to develop*

whether comprehension skills or environmental content. There is no policy guideline on how to go about EE integration; to me it is very stressful" (Respondent, 1).

All respondents in this study shared similar concerns. They are used to a prescribed and defined syllabus that gives clear guidelines on what to teach and a specific skill that ought to be developed. However, with the inclusion of EE into all subjects, there is no direction on how it should be done. These frustrations exhibited by respondents have an adverse effect on the teaching and implementation of EE as an integrated component into other subjects. Respondents admitted that they have not received any training from the district office or from Education Development Officers (EDO) or from any subject advisers. Therefore, they do not know what to teach with regards to EE integration into their subjects, and the idea of EE integration into other subjects still remains a mirage**.**

Period allocated time

Respondents admitted that the time allocated to them on their school timetable is not enough, even to finish their subject content since each period last for about 45 minutes on the timetable. Grade 12 is the exit class for the FET phase and it is the final preparation stage for matric exams; therefore, time is of great significance to both teachers and learners. The pressure of finishing the syllabus within a limited period is a huge challenge on the part of subject teachers.

Teachers are focused on the content areas that are examinable and produce results. Therefore, teachers have less time to search for ways to integrate EE into their content area. Respondents believe that the time to teach the core content is limited and they have limited time to think of integrating EE content into their subjects. Grade 12 assessment instructions for each year only give attention to content areas that are examinable, and nothing about EE integration. The Assessment Instruction is what guides teachers on what to do, what to teach and what to assess at a given period. Therefore, with the limited time, teachers are more focused on topics that are examinable as prescribed in the assessment instruction. There is no time to waste on teaching topics that are non-examinable. For teachers to integrate EE effectively, more time has to be allocated to each subject. A respondent had this to say:

"I don't mind teaching EE in my subject, if it is clearly specified in the Syllabus, besides syllabus issue, I have less allocated period on the timetable and more content areas to finish within a limited time, without finishing the syllabus my learners are bound to fail their matric exams. Hmmm… there is too much pressure on those of us teaching Grade 12 classes. We concentrate only what is written in the assessment instruction. I do not have enough time to look for information on how to integrate EE, it is hectic ".

Teaching and learning related factors

Respondents said one of the challenges hindering the integration of EE is teaching and learning. To ensure effective teaching and learning in the classroom, there are many factors that come into play. These factors include proper classroom management and provision of teaching and learning materials. Respondents were concerned with overcrowded classrooms in township schools and lack of teaching and learning materials. Lessons can be well-taught only when there is coherence and order in the classroom setting. Overcrowded classrooms make the class noisy and do not support effective lesson delivery.

Large class size

Respondents highlight that large class size is a major problem that hinders EE integration. In teaching EE as an integrated component, respondents need to adopt a participatory approach of teaching. However, with a class of 65 learners, it is extremely difficult to teach, even if EE is clearly specified in the syllabus.

Respondents admitted that overcrowded classes hinder effective teaching and learning. They struggle to manage their classrooms with big numbers, and it is very difficult to assess their work to get positive feedback. This factor makes it difficult for teachers even to think about ways to integrate EE into their content areas.

Environmental learning sometimes involves taking learners to do practical work, but with such big class numbers, it is impossible to do so. Through observation, the researcher saw that most learners had no spaces to sit during an English period in Grade 12. Most students were sitting on broken chairs and others stood at the corners of the classroom. Effective teaching and learning goes with effective classroom planning, which includes a comfortable class. A respondent had this to say:

"My major concern as teacher is the overcrowded classrooms. There is too much noise in the classroom and it is very difficult to control learners due to the large size of classes. Even if we intend to integrate EE into our subject content, I don't know how effective it may be" (Respondent, 6).

From the above statement, it can be concluded that overcrowded classes hinder progress of teaching and learning, and this could affect the implementation of EE as an integrated component.

Lack of teaching and learning resources

Respondents revealed that there is lack of teaching and learning resources, and this hinders the effectiveness of their lesson delivery. Most respondents confirmed that their lesson delivery is mostly abstract in nature due to lack of teaching and learning materials. This is a major challenge in teaching and learning. A respondent said:

"Even if we intend to teach EE, we have no teaching and learning materials. It shall be unwise to teach environmental related topics in abstract and there is lack of materials and funding to buy them ourselves" (Respondent, 5).

Further interaction with respondents revealed that even with traditional subjects like Life Sciences, Physical Sciences, teachers do not have the relevant teaching and learning material to do the practical component of the subject, as prescribed by the curriculum. Mostly, their teaching is purely based on the theoretical aspect, thus neglecting the practical aspect. There is no scientific laboratory in the school where the study took place, and learners study sciences just like History, memorising scientific terms without knowing the practical aspect of the subject. Even though respondents are willing to integrate EE into their subjects, lack of teaching and learning resources remain a serious academics challenge.

Most learners, as observed by the researcher on the field of study, have text books shared among learners. Respondents struggle to give homework to learners due to lack of study material. How would teachers manage to explain concepts in textbooks to learners sharing one textbook?

This is a major challenge that affects teaching and learning from all angles, including incorporating of EE into other subjects. Another respondent indicated that,

> *"We have no teaching and learning materials; the worse of it all is that, there is no provision of funds to buy teaching and learning materials either and this is very critical issue affecting effective teaching and learning".*

Respondents added that there is shortage of textbooks, teacher's guide and other relevant teaching and learning materials. With the introduction of EE as an integrated component into other subjects, there should be provision of relevant teaching guides and other teaching materials to assist teachers to teach EE effectively. Some teachers are willing to volunteer their time to buy these teaching and learning materials. However, there is no funding allocation for teaching and materials. Teaching of EE is not entirely an indoor subject; there is a need to take these learners on field trips for them to have a practical experience on issues pertaining to the environment.

Teacher-related factors

One of the challenges hindering the implementation EE integration into other subjects is the teacher related factor. The success of EE integration largely depends on the teacher's involvement. The teacher is the heart of the system, and whatever affects the teacher directly affects the entire school curriculum. The CAPS document prescribes EE integration into all subjects, which makes the teaching of EE a collective responsibility. The main actors of EE integration implementation are themselves a constraint to the success of the integration.

From the interview conducted, it was discovered that most respondents lack the ability and the competence to teach EE as an integrated component. Most of them lack basic knowledge about the environment, so their ability to teach EE is questionable. It was revealed during the interview that, most were not fully informed about the CAPS document and its content. Therefore, teachers are incapable of

integrating EE content into their respective subjects, as per their interview responses. Most respondents could not even define EE; therefore, how could they devise appropriate teaching methodology to implement EE integration into their subjects?

The CAPS document indirectly urges teacher to be more innovative in thinking about ways to teach EE in their subjects. The syllabus of each subject, especially non-sciences related subjects, does not specify where, when and how to integrate EE into the content of their subject. There is no policy guideline to assist teachers in lesson planning. Therefore, the curriculum requires innovative thinkers, people with the ability to think outside the box to find their own means to integrate EE into other subject. Based on the interviews, it was revealed that most respondents were not willing to do anything that is not prescribed by their subject syllabus. With such a stereotype mind set, the idea of EE integration is only possible on the face of the CAPS document, but its practical implementation remains a serious challenge. In analysing the interview responses, the researcher discovered that lack of expertise and administrative support are hinder the implementation of EE.

Lack of expertise by teachers

As explained above, most respondents do not understand the basic concepts of EE. Respondents indicated that, for them to teach EE effectively as prescribed in the curriculum, they need to master the content of EE and be more knowledgeable about what to teach. This may boost their confidence in teaching EE as an integrated component into other subjects.

According to respondents, since the inception of the CAPS document in 2011, they have not received any formal training on how to integrate EE into their respective subjects. There has being no training material or assessment instruction guidelines on what to teach and the extent to which EE should be integrated. As a result, most respondents see EE integration as a punishment from the Department of Education and it remains a huge challenge because they lack the expert knowledge to implement EE into their subjects. A respondent indicated that,

> *"The problem I have in the integration of EE into my content is that I do not have the expert and tactical way of strategizing on how to teach EE. I have little knowledge about EE and it is extremely difficult to blend EE*

content in my subject because as a teacher, I am not fully privy to environmental issues, therefore, what am I going to teach in the classroom? (Respondent, 6).

Another responded added that,

"*I did not study EE at school. I have no idea about the methodologies used to teach EE into my subject content. Therefore, teaching, EE is a major challenge on my side"*

According to respondents, they face serious setbacks in the implementation of EE with insufficient knowledge of EE. Therefore, most of them are incapable of teaching the EE as an integrated component. The situation could be improved with administrative support discussed next.

Lack administration support

Most respondents complain about lack of support as another challenge that impedes the implementation of EE. As indicated above, there is no clarity on how EE should be integrated into other subjects. To ensure effective teaching and learning of EE, teachers were supposed to be trained since the inception of the CAPS document. Eight years down the line, not a single workshop or training has being done by the departmental officials or schools. Teachers admitted that there is lack of support even from colleagues. The main concern is that all teachers are clueless on how to implement EE integration into their subjects.

A respondent indicated that,

"One of the challenges I have with regards to EE implementation is lack of support from the district office, school administration and colleague teacher, most of my colleagues have no clue on how to integrate EE and its unfortunate I cannot get support from anyone".

Teachers are expected to help one another whenever a colleague needs an explanation or interpretation on certain topics or concepts. In this case, teachers are not able to do so because they do not have sufficient information on EE implementation, and the school has no support to offer to teachers to integrate EE effectively.

With the above stated challenges facing EE implementation, it is an open secret that EE integration is still in limbo. The main actors are under-resourced and confused on how to go about the idea of EE integration into other subjects. The policy has failed to spell out a clear direction on how teachers should integrate EE into their subjects. Therefore, the idea of EE integration faces serious challenges. It is doable theoretically but practically, it has failed to achieve the anticipated results due to the numerous problems confronting its implementation in the classrooms. Conclusions, findings and recommendations of this study are discussed in the next chapter.

CHAPTER FIVE

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

5.1 INTRODUCTION

This chapter discussed the main findings of the study. These include: summary of research findings, limitations of the research study, recommendations, suggestions for future study and conclusion.

This chapter also presents the findings made by the researcher during interviews with teachers. In the process of conducting interviews, the researcher ensured that respondents were treated fairly and participated willingly. They were interviewed at their convenience to avoid disruption of instructional hours, and the researcher was given access to an empty classroom to conduct the interviews.

Respondents were informed of their right to participation, confidentiality, the right to opt out, and no monetary incentives were offered to them; they signed the consent form to indicate their acceptance. The researcher created positive rapport during the interviews. The purpose of the study was clearly explained to the respondents as presented in the study. The researcher discussed findings with regards to the newly revised CAPS (2011) document with respect to respondent's subject areas as stated in Chapter 4. Findings of the study, limitations of the study, recommendations, and suggestions for future studies are discussed below.

5.2 SUMMARY OF THE RESEARCH FINDINGS

The findings are categorised according to the objectives of the research study.

i) Teachers' awareness of EE integration in the school curriculum;

ii) Teachers' understanding of EE integration in the school curriculum;

iii) Teachers' integration of EE into their respective subject area;

iv) The importance of EE integration into the Grade 12 curriculum; and

v) Challenges teachers face in the integration of EE.

5.2.1 Teachers' awareness of EE integration in the school curriculum

Teachers' awareness of EE integration is of utmost importance to the implementation of EE as an integrated component. In order to establish teachers' awareness of EE integration, respondents were asked if they were aware of EE integration into their subjects. The responses from respondents were varied from subject to subject. In finding answers to the question, the responses received from six (6) respondents were categorised into two, namely, those who are aware of EE integration into their subjects and those who are uncertain of EE integration.

The responses given by various teachers suggested that most are not conversant with EE integration into their traditional subjects. There are many environmentally related chapters in most subjects, but since there is no clear definition and guidelines in those topics as EE, teachers battle to identify them.

Teachers teaching science related subjects and Geography find it easy to integrate EE into their teaching subjects, but most respondents are not comfortable with EE integration into their teaching. According to them, there is no policy guideline on how to integrate EE. This creates a challenge to identify a topic that requires integration and vice versa. The level of despondence exhibited by respondents prompted the researcher to probe further to ascertain the understanding teachers have on the integration of EE into their teaching subjects so that it could be well implemented.

5.2.2 Teachers understanding of EE integration in the school curriculum

In the process of unpacking teacher's understanding of EE integration, the researcher tried to find out what respondents knew about the environment by explaining the term *environment*. The researcher probed further to establish if respondents were aware of EE integration into respective subjects. It became evident that, most respondents could not even define the term properly and were not well informed about the integration of EE into all subject content areas, as prescribed by the CAPS (2011) document**.**

The second research question sought to investigate teachers' understanding of EE and its integration in the school curriculum. It is of great importance to know teachers' understanding of the environment as this shall influence EE integration into the school curriculum. In seeking teachers' understanding, respondents were asked to explain the meaning of EE, and they gave varied views of their understanding of EE. Analysis of data collected shows that teachers who are the frontiers of EE implementation do not have in-depth knowledge about the environment and EE. Other respondents gave statements suggesting that, most do not understand the concept of EE integration. Conflicting views shared by respondents raise serious concerns about how EE is integrated in schools.

5.2.3 How teachers integrate EE into their respective subject area

To establish how teachers, integrate EE into their content areas, the researcher urged teachers to share their experiences on how they teach EE in their subjects. From the discussion, it was brought to bear that there is no common structure in the way in which teachers can incorporate EE into their subject areas. There are different approaches that vary from one subject to another. In the discussion, some teachers said they integrate EE as subject content while others said they integrate EE into their subject as teaching and learning material.

Some respondents admitted that they integrate EE at content level. The main objective is to impact the requisite knowledge to the learners. This implies that, EE content exists already in the traditional subject content. Therefore, teaching subject content indirectly achieves the purpose of teaching EE. A subject topic has specific topics with EE elements. Respondents teaching subjects like Geography, Life Sciences and Physical Sciences admitted that EE topics are well defined in the content area of the syllabus coverage, which makes it quite easy to incorporate them into their lesson delivery.

Respondents indicated that integrating EE content into other subject could affect lesson delivery. Instructional time could be wasted if the integration is not well structured or planned. Interestingly, respondents admitted that teaching a Grade 12 class is different from teaching the other Grades. Grade 12s are only concerned with

content areas that have a direct influence on their matric results. Therefore, unwarranted EE content integration may result to tediousness in the classroom.

5.2.4 The importance of EE integration into the Grade 12 curriculum

To unearth the importance of EE, the researcher posed questions to respondents. Most respondents believe it is important to teach EE in the Grade 12 curriculum. Grade 12 is the final stream in the FET band of the Basic Education curriculum in the South African education system. The phase prepares learners for tertiary education (DOE, 2011), is the exit class of the FET band and a transitional phase to tertiary education.

The majority of respondents believe it is important to teach EE in the school curriculum. EE is viewed by some as a tool to develop environmental knowledge, development of environmental skills in managing environmental problems. Other respondents' views were centred on development of understanding and positive attitude towards the caring of the environment and development of problem solving skills in dealing with environmental problems in communities. All the respondents assume that when learners are privy to environmental knowledge, it may directly translate into behavioural change.

Respondent views dwelt on the cognitive and affective development of learners. These aspects help learners to develop positive attitude towards the environment. Respondents believe that when learners are equipped with the requisite knowledge, skills and attitude to be role models in the society.

This knowledge could be used in their future endeavours. If learners are well endowed with a positive environmental attitude, they could help in developing and mentoring others to adopt similar behaviour on caring for the environment. With positive comments and numerous ideas shared during the interview, it could be seen that, respondents appreciate the integration of EE into their curriculum. They are willing to support the implementation of curriculum of integration into the school curriculum. It was established that EE can help to raise responsible citizens who could care for and protect the available natural resources.

5.2.4 Challenges teachers face in the integration of EE into the curriculum

Respondents disclosed that even though the idea of teaching EE as an integrated component is laudable and innovative, they admitted that they are not integrating EE into their subjects as prescribed by the CAPS document. The study established the following as the barriers of EE integration:

Curriculum factors

The researcher established that there is no clarity on how to integrate EE as prescribed by CAPS (2011). The syllabus of various subjects does not specify when, how and the extent of EE integration. There is no policy guideline to be followed by teachers, and this is a major setback on the implementation of EE as an integrated component.

Regarding period allocation time, the researcher established that teachers are focused on the content areas that are examinable and produce results. Therefore, teachers have less time to search for ways to integrate EE into their content area. Respondents believe that the time to teach the core content is limited, and they do not have enough time to think of integrating EE content into their subjects.

Grade 12 assessment instructions for each year only pay attention to content areas that are examinable, and nothing is said about EE integration. The Assessment Instruction is what guides teachers on what to do, what to teach and what to assess at a given period. Therefore, with limited time, teachers are more focused on topics that are examinable, as prescribed in the assessment instruction. There is no time to waste on teaching topics that are non-examinable. For teachers to integrate EE effectively, it was established that, more time should be allocated to each subject

Teaching and learning factors

To ensure effective teaching and learning in the classroom, there are many factors that come into play. These factors include proper classroom management and provision of teaching and learning materials. Respondents were concerned with overcrowded classrooms in the township schools and lack of teaching and learning materials. Overcrowded classrooms make the class noisy, and this does not support effective lesson delivery. The researcher established that overcrowded classrooms

and lack of teaching and materials were some of the factors hindering the implementation of EE.

Teacher related factors

The success of EE integration largely depends on the teacher's involvement. The teacher is the heart of the system, and whatever affects the teachers directly affects the entire school curriculum. The CAPS document prescribes EE integration into all subjects, which makes the teaching of EE a collective responsibility. The main actors of EE integration implementation are a constraint to the success of the integration.

The researcher established that most respondents lack the ability and the competence to teach EE as an integrated component. Most of them lack basic knowledge about the environment and their ability to teach EE is questionable. It was revealed during the interview that, most were not fully informed about the CAPS document and its content. Therefore, teachers are incapable of integrating EE content into their respective subjects, as per their interview responses.

5.2.5 Document analysis

The researcher critically analysed the CAPS (2011) document. The idea of EE integration into other subjects' content is laudable and very innovative. As prescribed by the curriculum, EE is not a stand-alone subject. The teaching of EE currently is a collective responsibility for all subject teachers, both at GET and FET phases.

The researcher discovered that EE integration is only mentioned at the introductory part of the CAPS document, to be specific, under broad aims and objectives of the curriculum. There is nowhere in the syllabus clearly defining what EE integration is all about. Secondly, there is no clarity on how, when and to what extent teachers are to integrate EE content into their respective subject areas. It was revealed that, many aspects of EE could not be incorporated in subjects that are not environmentally related. Therefore, the idea of integration has shifted more on traditional environmentally related subjects.

In the analysis of the document, the researcher discovered that subject teachers need to devise their own teaching strategies to include EE into their teaching. However, ever since the inception of CAPS in 2011, teachers are yet to be trained and resourced on how to integrate EE. The idea of EE integration into subjects remains an excellent policy theoretically, but in practicality, it is a mirage if things are not well planned and structured.

5.3 RECOMMENDATIONS

5.3.1 Re-alignment of the CAPS document

The idea of EE as an integrated component is very innovative and brilliant, but curriculum developers need to re-align the whole policy. There should be clear policy guidelines on how teachers should integrate EE into their subject content without any stress. There should be provision of assessment instructions to guide teachers on how to teach EE content in their subjects.

Curriculum developers are required to review the objectives of EE, stating explicitly what needs to be taught. The content should be rearranged to meet the goals of EE. Curriculum developers should consider integrating wide coverage of EE content into other subjects that are not environmentally related. The objectives of such topics should be clearly defined for effective teaching and learning. EE should be given more attention at the FET phase, specifically in Grade 12, which is the final and exit class of the phase. The researcher, therefore, suggests that, the national curriculum developer should:

1. Should provide curriculum materials with clear policy guidelines on how to integrate EE effectively into other subjects.

2. Curriculum developers should prepare adequate course materials to cover the various aspects of EE integration, as stated in the CAPS document. Workshops and training should be provided whenever material is given to teachers to develop their competence in teaching of EE in the classroom.

3. There should be regular workshops to help in capacity building. These orientation programmes may help teachers to improve and sharpen their skills in the teaching of EE.

4. Universities should re-align their curriculum to have an EE integrated component so that newly trained teachers would be able to integrate EE without any impediment. Appropriate teaching strategies and other relevant techniques should be taught before students graduate as qualified teachers ready to implement EE content into their subjects of speciality.

5.3.2 Environmental Education should remain as an integrated subject

The researcher suggests that EE should remain as an integrated subject. The burden of conserving, caring for and protecting the environment should not be a section of people in the society. It is our collective responsibility to ensure that the environment is well taken care of. It is therefore important for every child to acquire basic environmental knowledge. The significance of EE integration is priceless and endless.

None of the teachers interviewed in the study suggested that EE should be a stand-alone subject. The researcher believes that if the curriculum is well structured and teachers are well resourced, the idea of EE integration could yield tremendous results. This could help to create environmental awareness. The researcher strongly believes that, effective EE integration across curricular can produce responsible citizens who are environmentally minded to preserve the environment for the next generation.

5.3.3 Environmental Education Subject advisors needed at district offices

From the study, it was revealed that teachers lack expert knowledge on how to plan a lesson to cover EE content in their subject. Secondly, it was established that, there is no support from district offices on how to integrate EE. With the above stated factors hindering the implementation of EE, the researcher suggests that qualified specialised subject advisors are to be appointed at the various district offices. These officers could serve as resource persons to facilitate the integration of EE into other content areas.

Though EE is not a stand-alone subject like other subjects, its implementation as prescribed by the CAPS document, is too technical and requires strategic planning to ensure effective implementation in the classroom. Presently, there are no checks and balances on how teachers integrate EE across curricula. There is no policy yet to monitor the implementation of EE as an integrated component into other subjects. Therefore, appointment of qualified subject advisors may drive the implementation of EE integration. Teachers can then be guided whenever there is a need to do so. From the interviews conducted, the researcher can confirm that, if teachers are given the needed administrative support, they may be able to integrate EE into their subjects effectively without any hassles. Until such measures are implemented, the noble intention behind the introduction of EE as an integrated subject shall not be known.

5.3.4 Environmental Education training in Universities and Colleges

Most teachers do not have in-depth knowledge of EE. It was revealed during the interviews that teachers do not have sufficient knowledge on EE. Most of them are not competent to integrate EE into the content areas of other subject. The researcher established that there is huge gap between the training teachers receive at various universities in South Africa and their practice. The researcher, therefore, suggests that, EE should be a stand-alone core module for all teachers at the various universities. EE should be compulsory for all trainee teachers. In view of this, trained teachers would be more knowledgeable about the environment and capable to teach EE in other subjects.

The researcher proposes that there should be well-crafted teaching methodologies taught at various universities, which may help trainee teachers to integrate EE effectively across curricula. The training teachers receive at universities and colleges should reflect on their classroom practices. Higher Education Institutions (HEI) should review their curriculum to accommodate the inclusion of EE as a compulsory module for all teacher trainees.

5.3.5 Government intervention in EE teaching and learning

There should be a political will to support the implementation of EE as an integrated component across curricula. The national government, through the Department of Basic Education, should allocate sufficient funds into the training of subject teachers. The National government has a constitutional obligation to protect the citizenry against any environmental hazards. It is, therefore, mandatory for government to take pragmatic steps to preserve and protect the available natural resources. This may only be achieved through the teaching of EE in schools. The researcher suggests that the national government should invest in the implementation of EE integration in order to achieve the anticipated results as a country.

5.4 LIMITATIONS TO THE STUDY

The researcher encountered several problems that delayed the study. These limitations are discussed below.

5.4.1 Selection of one school

One school was selected for the study to avoid the movement from school to school and incurring too much cost since funding did not cover field work.

5.4.2 Language Barrier

All the six respondents interviewed in this research study were mainly IsiXhosa speakers. They were reluctant to speak English in response to questions posed by the researcher. This was a serious limitation in the study because respondents were comfortable with their local dialect than English language. In this case, the researcher had to find someone to interpret a portion of the interview that was done in the IsiXhosa language. The study was conducted in a school situated in township dominated by only blacks. Therefore, views expressed do not represent the cultural diversity of South Africa. It can be concluded that views shared by respondents in the study do not represent all the schools in South Africa.

5.4.3 Respondents' unwillingness to participate in the study

The researcher made prior arrangements with all the respondents, days and times were set up. Unfortunately, on the very day of the interviews, some of them pulled out, and this had adverse effects on the planning of the interviews. The researcher had no option than to replace them with others willing to participate in the study. Respondents were not willing to participate since there was no monetary incentives for them. This did not have any negative effect on the study whatsoever.

5.4.4 Undue delay of the Ethical Clearance Certificate from University of Fort Hare

It took over 4 to 5 months for the university to issue the ethical clearance for the study. The researcher was stuck during the period of waiting for clearance not knowing what to do and what steps to take with regards to the study. This delay affected the completion time of this research study. It also cost the researcher financially since the research funding only caters for two academic years of study. The researcher had to pay full tuition fees for the third year in which the study was completed.

5.4.4 Undue delay of the permission letter from the Department of Education

No researcher may carry out an academic study in a public school without the departmental approval letter. It took 5 months for the researcher to receive the permission letter from the Eastern Cape Department of Education (ECDOE). This had an adverse effect on the entire study. The researcher wasted almost half of a year without going to the field to collect data due the delay in the issuing of the permission letter. This nearly made the researcher to give up on the study. The researcher had to travel up and down in search of this letter from the provincial Department of Education, and this affected the progress of work and completion time.

5.5 SUGGESTIONS FOR FURTHER STUDY

In this study, the researcher investigated teachers' perception of EE integration into the Grade 12 curriculum. This study limited the sample to only six teachers. The views of the six teachers could not represent the general population of teachers. The researcher, therefore, recommends that further studies be undertaken to cover more respondents and more schools.

Investigating teachers' perceptions of EE integration into the Grade 12 curriculum was too broad for the study. Further research could concentrate on the perceptions of teachers in a specific subject, not subjects. Future research study could also focus on re-alignment of the curriculum for effective EE integration in schools.

The findings of this study revealed that some teachers lack the ability to integrate EE into their subjects. Therefore, new research could focus on teachers' competences in the teaching of EE in schools**.**

5.6 CONCLUSION

In conclusion, the researcher would like to highlight that the study achieved its main objectives of finding teachers' perceptions of EE integration. All the research questions stated in Chapter one of this study were answered.

Literature was reviewed in Chapter 2 and presented views from different perspectives, local to international. On the theoretical framework, the researcher adopted an opportunity to learn, and this was well discussed and aligned to the study.

In Chapter 3, the researcher discussed the methodology and design of the study. The topics highlighted include, the research approach in this case qualitative was adopted for the study, research paradigm, research design, sample and sample techniques, all discussed in detail.

In Chapter 4, data of the study was successfully analysed by the researcher. The inductive style of analysis was used by categorising data according to the research questions**.**

In Chapter 5, the researcher highlighted the findings of the study and critical issues were discussed.

Concluding Remarks

Integration of EE content into other subject content areas is an innovative way of addressing the global environmental crisis. Effective EE integration can help learners to acquire knowledge, skills and positive attitude towards the environment. Knowledge and skills acquired from school shall promote environmental literacy.
Teaching of EE as integrated component could make huge impact in the lives of learners post-schooling, as they can be responsible citizens who may care for and protect the environment from further degradation.

The study was conducted in a black township where environmental pollution has been the norm. People litter indiscriminately without considering the environmental effects of their actions on the environment. It is believed that most learners will go back and live in their communities after their matric examinations. They serve as role models and could influence others' attitudes towards the environment. Therefore, it is of utmost importance to ensure effective implementation and teaching of EE as an integrated component across curricula.

The integrated content of EE into other subjects should be stated in clear terms for teachers to know what to teach in a specific subject content area. As established in this study, all respondents applauded the idea of EE integration. However, most teachers see integration as very complicated. Teachers should be equipped with the requisite training and skills to make the teaching of EE less complicated and effective. It was noted that teachers do not get administrative support from district education offices. Teachers need to be resourced to function effectively. Under-resourced teachers are underperforming teachers. There is a need to appoint qualified subject advisors specifically for EE integration.

Finally, in order to ensure effective implementation of EE integration into all subjects, the present CAPS document needs to be re-aligned or adjusted to cover a wider range of EE topics in other subjects. The current form is biased towards Life Sciences and Geography. The curriculum should specify and define exactly how, where and the extent to which subject teachers should integrate EE into their subjects. The objectives of subject syllabi should clearly spell out how EE should be integrated**.** The curriculum of Higher Education Institutions (HEI) should introduce EE as a compulsory module for all trainee teachers. This would make them fully prepared to integrate EE effectively after their training. Until these challenges are addressed, the idea of EE integration shall be a laudable idea theoretically but in reality, it shall remain a mirage.

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APPENDICES

APPENDIX A: INTERVIEW SCHEDULE FOR GRADE 12 TEACHERS

My name is Benjamin Damoah MEd candidate at the University of Fort Hare. I am conducting a research on teachers' perception of the integration of environmental education into grade 12 Curriculum in East London education district. I want to assure you of strict confidentiality, that everything discussed here will not be repeated to anyone. Should you feel uncomfortable at any juncture of this interview feel free to end the interview. I would like to record this interview on tape-recorder in order to ensure that I do not misquote you. Thank you for your willingness to participate in this study.

A: Background information.

Thank you for accepting to participate in this academic research. Tell me about yourself.

Respondent: Teacher

Date of the interview: _____/_____/_____

Time: _____

Venue: _____

Interviewer: Benjamin Damoah

1. Your age range …… 2. Marital status……..

3. Your highest academic qualification……

4. Occupation……

5 Number of children……..

6. Cluster……

QUESTIONS

1 These questions are designed to explore views of teachers regarding the integration of environmental education into grade 12 curriculum.

1. What field of qualification do you have?

2. How long have you taught your subject in grade 12?

3. Do you have any idea about the integration of environmental education into other subjects? If yes what is your understanding of the integration?

4. Do you think environmental education should be integrated into grade 12 subjects? If yes, why?

5. Do you think there is any integration of environmental education in the CAPS syllabus at the FET phase? Explain

6. Which aspects of your subject area have the integration of environmental education themes in them?

7. How would you describe the integration of environmental education in the CAPS syllabus?

8. Do you think more integration of environmental education in your respective subject is still needed?

9. Which areas of your subject do you think need more themes of environmental education to be integrated?

10. Do you think FET phase teachers have a clear understanding of the concept of EE integration?

11. Do the ways in which EE is taught as an integrated component reflect understanding of environmental issues and concepts?

12. During training or workshops for grade 12 teachers, did the teachers' training syllabus cover issues of environmental education?

13. Do you understand the environmental issues and concepts as integrated into the CAPS syllabus? `

14. How would you describe your understanding and conception of environmental issues and concepts in your subject?

15. Do you think teachers' pay enough attention to the integration of environmental education in their lesson delivery?

16. Do the pupil you teach easily understand the environmental issues and concepts that you teach from the syllabus?

17. Do you think grade 12 teachers encounter challenges and limitations in the integration of EE into their lesson delivery? If yes what are some of the challenges and limitations?

18. What strategies do you use to blend environmental education into the teaching of your subject?

19. What suggestions would you recommend for effective teaching of environmental education as an integrated component in your subjects' curriculum?

Thank you for your participation.

APPENDIX B: PERMISSION TO CONDUCT RESEARCH

199 Voortrekker road
Summer pride
East London
5247
13 /02/2018

The District Director,
Department of Education
East London District
Mdantsane
5219

Dear sir/madam,

REQUEST FOR PERMISSION TO CONDUCT A RESEARCH

I do hereby seek for permission to conduct Master of Education Research Study entitled **"Teachers perception of the integration of environmental education into grade 12 curriculum in East London education district**".

The researcher intends to conduct the study in one public high school around Mdantsane, in the East London education district. I have attached copies of:

1. Ethical clearance certificate from University of Fort Hare's Research Ethics Committee (UREC)

2. Ethics Confidentiality Consent Form

3. Interview Questions

Your assistance in this regard shall be highly appreciated.

Yours in Education

……..

Mr. B. Damoah (Researcher)

APPENDIX C: DEPARTMENT OF EDUCATION'S APPROVAL LETTER TO CONDUCT RESEARCH

Province of the
EASTERN CAPE
EDUCATION

STRATEGIC PLANNING POLICY RESEARCH AND SECRETARIAT SERVICES
Steve Vukile Tshwete Complex • Zone 6 • Zwelitsha • Eastern Cape
Private Bag X0032 • Bhisho • 5605 • REPUBLIC OF SOUTH AFRICA
Tel: +27 (0)40 608 4773/4035/4537 • Fax: +27 (0)40 608 4574 • Website: www.ecdoe.gov.za

Enquiries: B Pamla Email: babalwa.pamla@ecdoe.gov.za Date: 07 February 2019

Mr Damoah Benjamin

199 Voortrekker Road

Semmerpride

East London

5247

Dear Mr D Benjamin

PERMISSION TO UNDERTAKE A MASTERS' STUDY: TEACHERS' PERCEPTION OF THE ENVIRONMENTALLY EDUCATION INTO GRADE 12 CURRICULUM IN EAST LONDON EDUCATION DISTRICT

1. Your application to conduct the above mentioned research from one selected Secondary School under the jurisdiction of Sarah Baaartman District of the Eastern Cape Department of Education (ECDoE) is hereby approved based on the following conditions:

    a. there will be no financial implications for the Department;

    b. institutions and respondents must not be identifiable in any way from the results of the investigation;

    c. you seek parents' consent for minors;

    d. it is not going to interrupt educators' time and task;

    e. you present a copy of the written approval letter of the Eastern Cape Department of Education (ECDoE) to the Cluster and District Directors before any research is undertaken at any institutions within that particular district;

    f. you will make all the arrangements concerning your research;

    g. the research may not be conducted during official contact time;

h. should you wish to extend the period of research after approval has been granted, an application to do this must be directed to Chief Director: Strategic Management Monitoring and Evaluation;

i. your research will be limited to those institutions for which approval has been granted, should changes be effected written permission must be obtained from the Chief Director: Strategic Management Monitoring and Evaluation;

j. you present the Department with a copy of your final paper/report/dissertation/thesis free of charge in hard copy and electronic format. This must be accompanied by a separate synopsis (maximum 2 – 3 typed pages) of the most important findings and recommendations if it does not already contain a synopsis.

k. you present the findings to the Research Committee and/or Senior Management of the Department when and/or where necessary.

l. you are requested to provide the above to the Chief Director: Strategic Management Monitoring and Evaluation upon completion of your research.

m. you comply with all the requirements as completed in the Terms and Conditions to conduct Research in the ECDoE document duly completed by you.

n. you comply with your ethical undertaking (commitment form).

o. You submit on a six monthly basis, from the date of permission of the research, concise reports to the Chief Director: Strategic Management Monitoring and Evaluation

2. The Department reserves a right to withdraw the permission should there not be compliance to the approval letter and contract signed in the Terms and Conditions to conduct Research in the ECDoE.

3. The Department will publish the completed Research on its website.

4. The Department wishes you well in your undertaking. You can contact the Director, Ms. NY Kanjana on the numbers indicated in the letterhead or email nelisa.kanjana@ecdoe.gov.za should you need any assistance.

NY KANJANA
DIRECTOR: STRATEGIC PLANNING POLICY AND RESEARCH

FOR SUPERINTENDENT-GENERAL: EDUCATION

APPENDIX D: ETHICS RESEARCH CONFIDENTIALITY AND INFORMED CONSENT FORM

University of Fort Hare
Together in Excellence

Ethics Research Confidentiality and Informed Consent Form

I Damoah Benjamin of University of Fort Hare, is asking teachers to answer some questions, which we hope will benefit the community and the entire nation in the future.

I Damoah Benjamin is conducting research **regarding teacher's perception of the integration of environmental education into grade 12 curriculum in East London education district.**

I am interested in finding out more about teachers' perception of the integration of environmental education into grade 12 curriculum, in order to address the poor integration of EE into teacher's respective subjects. I am carrying out this research to help to contribute to national curriculum development in South Africa in the integration of EE into all the various subjects in the school curriculum. It shall identify the gaps in the curriculum process, planning and designing regarding the integration of EE into other subjects in Grade 12. This study shall be helpful to curriculum developers in the review of the curriculum. Challenges faced by educators shall be known and this would be significant to the Department of Basic Education in curriculum design, development, implementation and assessment

Please understand that you are not being forced to take part in this study and the choice whether to participate or not is yours alone. However, we would really appreciate it if you do share your thoughts with us. If you choose not take part in answering these questions, you will not be affected in any way. If you agree to participate, you may stop me at any time and tell me that you don't want to go on with the interview. If you do this there will also be no penalties and you will NOT be prejudiced in ANY way. Confidentiality will be observed professionally.

I will not be recording your name anywhere on the interview and no one will be able to link you to the answers you give. Only the researchers will have access to the unlinked information. The information will remain confidential and there will be no "come-backs" from the answers you give.
The interview will last around 20 minutes. I will be asking you a question and ask that you are as open and honest as possible in answering these questions. Some questions may be of a personal and/or sensitive nature. I will be asking some

questions that you may not have thought about before, and which also involve thinking about the past or the future. I know that you cannot be certain about the answers to these questions, but I ask that you try to think about these questions. When it comes to answering questions there are no right and wrong answers. When I ask questions about the future, I am not interested in what you think the best thing would be to do, but what you think would actually happen. Semi structured interview shall be used, and questions shall be rephrased in order to determine the exact perceptions and views of the respondents.
If possible, I would like to come back to this area once I have completed this study to inform you and the school of what the results are and discuss our findings and proposals around the research and what this means for the development of education.

INFORMED CONSENT

I hereby agree to participate in research regarding **teachers' perception of the integration of environmental education into grade 12 curriculum**. I understand that I am participating freely and without being forced in any way to do so. I also understand that I can stop this interview at any point should I not want to continue, and that this decision will not in any way affect me negatively.

I understand that this is a research project whose purpose is not necessarily to benefit me personally.

I have received the telephone number of a person to contact should I need to speak about any issues which may arise in this interview.

I understand that this consent form will not be linked to the questionnaire, and that my answers will remain confidential.

I understand that if at all possible, feedback will be given to my community on the results of the completed research.

……..
Signature of participant **Date**:……..

I hereby agree to the tape recording of my participation in the study

……..
Signature of participant **Date**:……..

APPENDIX E: LANGUAGE EDITING CERTIFICATE

23 Elfin Glen Road, Nahoon Valley Heights, East London, 5200

Professional EDITORS Group

To whom it may concern:

This document certifies that the dissertation whose title appears below has been edited for proper English language, grammar, punctuation, spelling and overall style. The editor, Rose Masha, is a member of the Professional Editors' Group whose qualifications are listed in the footer of this certificate.

Title:

TEACHERS' PERCEPTION OF THE INTEGRATION OF ENVIRONMENTAL EDUCATION INTO GRADE 12 CURRICULUM IN EAST LONDON EDUCATION DISTRICT

Author:

DAMOAH BENJAMIN

Date Edited:

20 March 2019

Signed

Dr Rose Masha

B. Library & Inf. Sc.; HDE; Hons. ELT; M. Phil. Hyll.; PhD Ed

APPENDIX F: ETHICAL CLEARANCE CERTIFICATE

University of Fort Hare
Together in Excellence

ETHICAL CLEARANCE CERTIFICATE
REC-270710-028-RA Level 01

Certificate Reference Number:	GAL091SDAM01
Project title:	**Teachers perception of the integration of environmental education into grade twelve curriculum in East London Education District.**
Nature of Project	Masters in Education
Principal Researcher:	Benjamin Damoah
Supervisor:	Prof G Galloway
Co-supervisor:	N/A

On behalf of the University of Fort Hare's Research Ethics Committee (UREC) I hereby give ethical approval in respect of the undertakings contained in the above-mentioned project and research instrument(s). Should any other instruments be used, these require separate authorization. The Researcher may therefore commence with the research as from the date of this certificate, using the reference number indicated above.

Please note that the UREC must be informed immediately of

- Any material change in the conditions or undertakings mentioned in the document;
- Any material breaches of ethical undertakings or events that impact upon the ethical conduct of the research.

The Principal Researcher must report to the UREC in the prescribed format, where applicable, annually, and at the end of the project, in respect of ethical compliance.

Special conditions: *Research that includes children as per the official regulations of the act must take the following into account:*
Note: The UREC is aware of the provisions of s71 of the National Health Act 61 of 2003 and that matters pertaining to obtaining the Minister's consent are under discussion and remain unresolved. Nonetheless, as was decided at a meeting between the National Health Research Ethics Committee and stakeholders on 6 June 2013, university ethics committees may continue to grant ethical clearance for research involving children without the Minister's consent, provided that the prescripts of the previous rules have been met. This certificate is granted in terms of this agreement.

The UREC retains the right to

- Withdraw or amend this Ethical Clearance Certificate if
  - Any unethical principal or practices are revealed or suspected;
  - Relevant information has been withheld or misrepresented;
  - Regulatory changes of whatsoever nature so require;
  - The conditions contained in the Certificate have not been adhered to.

- Request access to any information or data at any time during the course or after completion of the project.

- In addition to the need to comply with the highest level of ethical conduct principle investigators must report back annually as an evaluation and monitoring mechanism on the progress being made by the research. Such a report must be sent to the Dean of Research's office.

The Ethics Committee wished you well in your research.

Yours sincerely

31/08/2018

Professor Pumla Dineo Gqola
Dean of Research

29 August 2018