Teachers' perceptions of environmental education integration in grade 10 subjects in selected Thohoyandou secondary schools

by

PATRICK VHULAHANI TSHIVHASE

submitted in accordance with the requirements
for the degree of

MASTER OF EDUCATION

in the subject

CURRICULUM STUDIES

at the

UNIVERSITY OF SOUTH AFRICA

SUPERVISOR: Dr A S MAWELA

OCTOBER 2019

Table of Contents

LIST OF TABLES

ABSTRACT

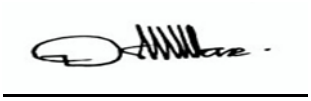
The purpose of this study was to explore the extent to which grade 10 Thohoyandou secondary teachers' integrated Environmental Education (EE) themes in Curriculum Assessment Policy Statements (CAPS) subjects and to suggest teaching approaches that can be used in the integration of EE themes. The theoretical framework was drawn from four key learning theories: place-based learning, social constructivism, outdoor experiential learning and connectivism. A qualitative research approach was employed as the researcher sought in-depth understanding of teachers' perceptions to- wards the integration of EE themes in their subjects. The study population comprised teachers integrating EE themes in grade 10 subjects. Convenient purposive sampling was used to select five (n=5) schools and ten (n=10) teachers as participants in this single case study. Data were collected through semi-structured interviews using a re- searcher-designed interview guide, document analysis and non-participatory observation. Content analysis was used to analyse data obtained. Results indicated that all teachers in this study were qualified to teach the subject and the grades they were teaching. Qualifications ranged from a secondary teaching diploma to the Masters in Education. However, no teacher had received prior training to integrate EE themes in their subjects. Teachers possessed knowledge and could apply some of the theories foregrounding EE in their subjects. Challenges faced by teachers in integrating EE themes in their subjects were lack of resources, overcrowded classes and poor learner involvement and understanding.

Key words

Teachers, Environmental Education, Integration, CAPS, Grade 10

DECLARATION

I, Tshivhase Vhulahani Patrick, hereby declare that the research submitted by me, has not been submitted previously for a degree at this or any other university, that it is my own work in design and in execution, and that all references material contained therein has been duly acknowledged.



Signature

28/02/2020

Date

ACKNOWLEDGEMENTS

I would like to express my appreciation to:

- My supervisor, Dr A.S. Mawela, for his assistance, patience and encouragement throughout this study;
- The local Department of Education for granting permission to conduct my study in the Vhembe district;
- All principals who allowed me to interact with their teachers in their schools;
- All teachers who participated in this study;
- My family, especially my wife and my children, for the support they gave me throughout the period of this study;

ACRONYMS

CAPS	Curriculum Assessment Policy Statement
DoE	Department of Education
EE	Environmental Education
EL	Experiential Learning
OBE	Outcomes-Based Education
PBE/L	Place-Based Education/Learning
RNCS	Revised National Curriculum Policy Statement
SA	South Africa
SC	Social Constructivism
UN	United Nations

CHAPTER 1
BACKGROUND AND OVERVIEW

1.1 INTRODUCTION

In South Africa and other parts of the world, environmental education (EE) is regarded as important to be taught in schools (Goodall, 2018). However, it is a curriculum subject that stands on its own (Nam, 2011). In many parts of the world, EE is integrated into other curriculum subjects (Kimiti and Kipkoech, 2013). EE themes are integrated into different curriculum subjects (Goodall, 2018).

The importance of EE cannot be overemphasised in raising awareness towards conserving the environment. Education is an essential tool through which the cultivation of positive values, knowledge, skills, and attitudes towards the environment can be achieved among learners. At various local and international meetings and conferences such as United Nations Educational, Cultural and Scientific Organisation (UNESCO) (1976), the Rio Earth Summit (1992) and the Johannesburg Summit (United Nations [UN], 2002) the need for EE teaching and learning in schools has been stressed. Responding to this call, South Africa like many other countries in the world integrated EE themes across the curriculum. Since 1994, South Africa revised the curriculum several times; this includes the introduction of outcomes-based education (OBE), the National Curriculum Statement (NCS), Revised National Curriculum Statement (RNCS) and currently the Curriculum and Assessment Policy Statement (CAPS). In all these policies, EE themes were integrated. However, the Department of Basic Education's (DBE) initiatives of integrating EE themes in curriculum subjects have not yet yielded positive results mainly due to a gap between the theory of teaching and that of integrating EE themes into CAPS subjects (Salleh *et al.,* 2016).

A large body of literature covering a wide range of curriculum integration topics has been generated globally with the intention of improving the teaching of EE themes in different subjects (Salleh *et al.,* 2016*)*. Despite all the efforts made to date, most teachers in South Africa experience challenges regarding the integration of EE themes

in their subjects (Blyth and Meiring, 2018). In the view of the current researcher teachers in South Africa, particularly those located in Thohoyandou secondary schools in Limpopo province, also experience a lack of awareness and skills required to integrate EE themes in the CAPS subjects. Kisoglu *et al.* (2017) found that most participants in their study (teachers) regarded EE as important and essential for every child; however, the same teachers were poorly prepared for the integration of EE and had been inadequately trained for this task.

The underlying purpose of teaching EE in schools is to prepare and equip learners with relevant knowledge and skills that can be used to conserve the environment and promote active participation. Therefore, the integration of EE themes into CAPS subjects is a necessity. Learners should be enabled to solve environmental problems (Obasoro, Oyinloye & Ilesanmi, 2012). However, failing to integrate EE themes into CAPS subjects deprives disadvantaged learners of the opportunity to learn how to conserve their environment. From his own experience as a grade 10 geography teacher, the researcher noticed that despite the existing policy on the integration of EE themes into CAPS subjects, very little has been achieved by the Department of Education (DoE) and teachers themselves on how to integrate EE themes in their subjects to an extent that learners can benefit. This is mainly due to several challenges that teachers are faced with in integrating EE themes in the school curriculum (Hebe, 2017). This study explored teachers' views regarding the integration of EE themes in grade 10 CAPS subjects in Thohoyandou secondary schools.

1.2 THEORETICAL FRAMEWORK

Various theories support teaching and learning in CAPS subjects. Place-based education (PBE), social constructivism (SC), outdoor experiential learning, and connective learning are some of the learning theories that endorse the teaching and learning of EE themes in CAPS subjects. These theories have different teaching approaches, however, they also complement each other.

According to Huang, Chen, and Chou *(*2016), PBE is the framework of learning and teaching which involves the communal reintegration of learners in exploring the local environment. Gosselin *et al.* (2016) states that in PBE place or environment is used to

integrate EE and is characterized by approaches that centre on problem-solving projects, learner-centered education and the exploration of the natural local community. According to Smith and Sobel (2014), PBE stresses hands-on and experiential activities through instruction and leads to increased academic achievement, helping learners to develop stronger ties with and appreciation of their environment. According to Alvarez-Garcia *et al.* (2015), PBE is focused on using the local community in the integration of learning.

Besides PBE, social constructivism (SC) theory is described as a learner-centered approach that pays attention to what the learner knows and allows the learner to put his/her knowledge into practice. It maintains that learning constructs meaning through experimentation (Creswell and Clark, 2017). According to Creswell and Clark (2017), SC is an essential theoretical framework that permits qualitative analysis to disclose insights necessary for teachers to integrate EE, based on people's interaction with the world. However, for the integration of EE themes with CAPS subjects, the theory is required in order to equip teachers with better teaching and learning methods.

The outdoor experiential learning theory promotes the teaching and learning that takes place outside the classroom (McLeod, 2013). This implies that provision should be made to train teachers on how to plan, implement and manage outdoor learning activities which will also promote thinking and help learners to construct meaning through experimenting. According to McLeod (2013), in Kolb's theory, learning involves the attainment of concepts that are applicable in different situations. In Kolb's theory, the impetus for the development of new concepts provides new experiences. Kolb's theory includes a four-stage learning cycle: concrete experience, reflective observation, abstract conceptualisation, and active experimentation.

The theories that underpinned this study are outdoor experiential learning and social constructivist theories. These two theories signify the roles of the teacher in integrating EE themes in CAPS subjects for the construction of meaning on environmental issues, thus promoting thinking on how to solve environmental problems by learners and experimentation during outdoor activities on how to conserve the environment, which unites theoretical knowledge and practice.

This study investigated the pedagogical knowledge and skills in integrating the outdoor experiential learning and SC theories in integrating EE themes in CAPS grade 10 subjects for the production of learners who are equipped with knowledge and skills required to address environmental problems in their local environment.

1.3 BACKGROUND OF THE STUDY

This section provides a background overview of the integration of EE themes in CAPS subjects. The focus is on the perception of teachers towards integrated EE themes in curriculum subjects; the proficiency level of teachers in integrating EE themes in curriculum subjects; and the challenges and success of integrating EE themes in CAPS subjects.

1.3.1 The perception of teachers towards integrated EE themes in curriculum subjects

The most common EE themes in CAPS subjects include pollution and recycle and re-use (Blyth and Meiring, 2018). Most teachers in South Africa have shown interest in certain EE themes, because of their practicality and relevance to school subjects. Few teachers realise that learners' enthusiasm makes it possible and simple for them to integrate EE themes and less than 66% indicated that their interest related to their qualifications (Blyth and Meiring, 2018). The researcher explored factors that enhance success and create challenges regarding the integration of EE themes in grade 10 CAPS subjects.

According to Bosah's (2013) study, the majority of the teachers in Nigeria felt that EE themes were insufficiently important to be made compulsory in their curriculum subjects; in contrast, other teachers felt that EE themes should be taught from a very early age in the learner's life as they are important. In other instances, the views regarding the integration of EE themes into subjects differ with regard to gender. According to Ozgul *et al.* (2018), male teachers rated EE themes more important than female teachers. Irrespective of gender considerations, generally 60% of teachers perceive EE themes as important in their curriculum subjects (Obasoro *et al.*, 2012). These findings indicate that some teachers are interested and others are not interested in integrating EE

themes in their subjects. The researcher was concerned with investigating the views of teachers on what makes male teachers more likely to be interested in integrating EE themes into curriculum subjects than female teachers.

1.3.2 The proficiency level of teachers in integrating EE themes in curriculum subjects

In most cases, the foreseeable difficulty for teachers integrating EE in the class is due to a shortage of pedagogical skills, knowledge, and experience. Teachers with prior experience learn the new skills required more quickly than others (Gossellin *et al.,* 2016). Ormond (2017) maintains that curriculum integration demands discipline, knowledge, and proficiency on the part of the teachers and can be seen as an extended part of professionalism. **L**ack of pedagogical knowledge on the part of teachers causes failure to integrate EE themes in CAPS subjects. EE has its focus on the environment, learning is done in and for the environment (Gosselin *et al., 2016*). The researcher investigated if teachers were sufficiently proficient in pedagogical knowledge and skills required to integrate EE themes in their subjects.

1.3.3 Challenges and success of integrating EE

In South Africa, different educational frameworks advocate the integration of EE themes. According to Hebe (2017), teachers in South Africa can integrate EE themes in their subjects, however to a limited extent. Radical public-private partnerships have emerged to improve the integration of EE themes; this includes the collaboration between both non-governmental and governmental organisations and local schools (Tshautshau, 2013). However, in South Africa, the integration of EE themes in curriculum subjects remains a challenge (Tshautshau, 2013). Most teachers did not receive training on the integration of EE themes during initial teacher education and it is viewed as a new teaching approach. As a result of the exclusion of this teaching approach teacher training, they are unable to integrate EE themes into their subjects and in certain instances, EE themes are taught less than others (Hebe, 2017). Mokhele (2012) found teachers were faced with the responsibility of making decisions regarding the teaching of EE themes; these decisions include topic coverage, its depth,

and high- lighting certain ideas, which results in very altered outcomes for learners, many of whom acquire shallow knowledge about the EE theme and are unable to answer questions adequately during examinations due to lack of information. Ketlhoilwe (2013) identified overcrowding in classes as another challenge. Overcrowding makes it difficult for teachers to apply the learner-centered approach during teaching and learning.

In Nigeria, EE seminars are held to ensure the success of EE integration, however, very few schools participate (Bosah, 2013). Many teachers in Nigeria have adequate knowledge about EE content and this plays a vital role in ensuring the success of EE integration (Bosah, 2013). Bosah's (2013) study in Nigeria on the challenges in integrating EE revealed that most teachers agreed that the concept of EE was difficult to teach due to lack of or inadequate facilities and a conducive environment. Teachers also indicated that the shortage of facilities and resources impacted the integration of EE themes in curriculum subjects negatively. This study explored the challenges and success of integrating EE in grade 10 Thohoyandou secondary schools.

1.4 PROBLEM STATEMENT

The significance of integrating EE themes in CAPS subjects cannot be overemphasised in South Africa and other parts of the world. EE themes promote environmental awareness and make learners feel responsible for conserving their local environment. It also promotes the quality of information and refines the capacity of using the information to carry out well-informed decisions and actions through intensifying learners' awareness and understanding of factors that negatively affect or modify the environment (Ozgul *et al*, 2018). The consequences of ignoring the integration of EE in school subjects include views EE as the process of producing citizens with a lack of knowledge of the biophysical environment and the inability of solving problems associated with it (Gough (2013). Therefore, integration of EE is very important.

Despite the importance of integrating EE themes in CAPS subjects, numerous studies have shown that a lot of countries restrained by ineffective integration of EE

in the curriculum (Mosothwane, 2002). These include countries such as Botswana. Such countries are faced with numerous challenges when it comes to the integration of EE. In South Africa, teachers experience challenges in finding a relevant teaching approach that is suitable for integrating EE themes into their subjects. This is because most teachers are not trained in integrating EE themes into CAPS subjects and also because EE is not their field of specialisation (Tshautshau, 2013). Despite the number of teachers who are willing to integrate EE themes in their CAPS subjects, lack of the knowledge and pedagogical skills needed engenders reluctance to realise this aim and thereby becomes a hindrance or an obstacle (Hebe, 2017).

Teachers continue to use teacher-centered and traditional methods of using the textbook and the chalkboard in many instances due to the teacher training that most received. The integration of EE themes in CAPS subjects demands a learner-centred approach (Hebe, 2017). Irrelevant teaching approach, lack of knowledge and pedagogical skills are contributory factors that hinder integrating EE themes in CAPS subjects and result in teachers either selecting certain themes or not teaching them at all. In the light of this the researcher explored teachers' views regarding the integration of EE themes in CAPS grade 10 subjects in Thohoyandou secondary schools.

1.5 SIGNIFICANCE OF THE STUDY

This study explored teachers' views regarding the integration of EE themes in grade 10 CAPS subjects. The researcher investigated, described and analysed teachers' views, their behavior towards integrating EE themes, factors that impede integration of EE themes in CAPS subjects, challenges and successes experienced by teachers when integrating EE themes in their subjects. It investigated the teaching approaches

CAPS subjects. It is anticipated that the findings can be used by the DBE for the professional development of educators regarding integration of EE themes in CAPS sub- jects in primary and secondary schools in South Africa.

1.6 RESEARCH QUESTIONS

Against the background of the above discussion, the key research question is expressed as:

To what extent do grade 10 Thohoyandou secondary school teachers integrate EE themes in CAPS subjects and what teaching approaches can be used to empower teachers for effective integration of EE themes?

The following sub-questions are aimed at further exploring the main research question:

- What are specific theories foregrounding the integration of EE themes in CAPS subjects?
- To what extent are teachers trained and empowered to integrate EE themes into CAPS subjects?
- What are the success and challenges experienced by teachers in integrating EE themes into CAPS?
- What recommendations can be made to improve the integration of EE themes into CAPS subjects in secondary schools?

1.7 AIM AND OBJECTIVES

1.7.1 Aim

This study aimed at exploring the extent to which grade 10 Thohoyandou secondary teachers integrated EE themes in CAPS subjects and suggesting teaching approaches that can be used in the integration of EE themes.

1.7.2 Objectives

Main objectives:

- To ascertain whether the teachers are aware of the importance of integration of EE themes in grade 10 CAPS subjects;
- To find out whether grade 10 teachers in Thohoyandou secondary schools integrate EE themes in CAPS subjects;
- To determine the factors that enable or inhibit the integration of EE themes in CAPS subjects in grade 10 Thohoyandou secondary schools.

1.8 RESEARCH DESIGN

For the purpose of the current study a qualitative research approach was adopted as the researcher sought in-depth understanding of teachers' perceptions towards the integration of EE themes in their subjects. Participants in this study were ten teachers who were sampled purposively from five (5) schools that formed part of a convenient sample. Data were collected through three methods: semi-structured interviews, non-participatory observation and document analysis. An interview guide and observation schedule were developed by the researcher and used. Content data analysis was implemented. Trustworthiness of the current study was ensured through credibility, transferability, dependability and conformability. Ethical clearance was sought and research ethics were upheld as stipulated by the university's ethical committee.

1.9 CLARIFICATION OF KEY TERMS

Environmental Education is a process of learning where people's environmental knowledge, challenges associated with it and how to deal with such challenges are addressed (Gosh, 2014). Integration of the action or process of combining two or more things together. Curriculum Assessment Policy Statement (CAPS) is the current syllabus that replaced the previous National Curriculum Statement (NCS) in South African schools (Salleh *et al*., 2016)

1.10 ORGANISATION OF DISSERTATION

The current study consists of six (6) chapters. In chapter one, the study illustrated the background of the study and overview, while Chapter two addressed the theoretical framework and outlined the theory foregrounding the current study. Chapter three presented the literature review obtained by other authors who carried out studies that were similar to the current study. Chapter four outlined the research design and methodology adopted for the purpose of this study, while chapter five presented data that was obtained during data collection through semi-structured interviews, non-participatory observation, and document analysis. Chapter six presented data analysis, data interpretation, conclusion, and recommendations that were drawn from data obtained during data collection.

1.11 CONCLUSION.

The aim of this chapter was to outline the introduction of the study which is based on the teachers' perceptions of environmental education integration in grade 10 subjects in selected Thohoyandou secondary schools in South Africa. The theoretical framework which underpins the study and the background of the study were briefly discussed. The magnitude of the problem of this study was highlighted in the problem statement and followed by the significance of the study. The research questions, aims, and objectives, research design description, key terms were clarified and the organisation of the dissertation was laid out. Chapter two focused on the theoretical framework.

CHAPTER 2
THEORETICAL FRAMEWORK

2.1 INTRODUCTION

This chapter aims at discussing specific theories foregrounding the integration of EE themes in CAPS subjects and how those theories relate to the current study. Various theories support teaching and learning in CAPS subjects. Place-based education (PBE), social constructivism (SC), outdoor experiential learning and connectivism are some of the learning theories that endorse the integration of EE themes in CAPS subjects (Akdeniz *et al.,* 2016*)*. These theories have different teaching approaches, however, they also complement each other.

2.2 THEORIES FOREGROUNDING THE INTEGRATION OF EE THEMES INTO CAPS

2.2.1 Place-based learning theory

According to Huang, Chen, and Chou (2016), place-based learning is the framework of learning and teaching in which the community and reintegration of the learner to study the local environment are involved. PBL requires the use of the social, cultural, and natural environment to gain knowledge and skills (Smith and Sobel, 2014). Gruenewald and Smith (2018) agree with Smith and Sobel (2014) by indicating that PBL can be assumed as local EE, with its integration based on standards of learning and extended further than the natural environment so as to also take account of the ethnic, economic as well as economic conditions of a certain place. Knapp (2014) agrees with Gruenewald (2014) and Smith and Sobel (2014) adding that PBL provides learners with the knowledge and experiences that are necessary for encouraging active participation in the democratic process. This implies that EE empowers learners to be involved in addressing everyday environmental problems that emerge.

Interdisciplinary learning, team-teaching, and hands-on experiences should be taken into consideration when integrating EE themes into other CAPS subjects. Gruenewald

(2014) concurs that PBL focuses on the concept of place or the environment as an integrating context across disciplines in order to promote learner-centered problem-solving skills. This implies that learner-centered education is essential in enhancing individual learner's skills and abilities to solve local environmental problems. It is the researcher's view that PBL helps learners to develop stronger ties with and appreciation of their environment. Seconding this view, Smith, and Sobel (2014) indicate that PBL emphasises hands-on activities and real-world experiential learning activities which increase learners' performance. Smith and Sobel (2014) assert that in PBL the local environment is used as learning context integration.

According to Knapp (2014), the characteristics of place-based education that make it distinct are that it is based on particular attributes of a place, specifically to ecology, political geography, sociology, and other relevant dynamics (Knapp, 2014). It is also inherently multidisciplinary in nature and experiential (in various programmes). The area of study can be its economic perspective in the curriculum allowing for the exploration of not only the local industry but also its sustainability; however, the entire curricula and programmes are designed to achieve broader objectives. This implies that EE can be a subject on its own as it covers features of a place and that the integration of EE themes could explore local environmental problems.

EE serves as the connection between the place, learners and community. Due to the ecological lens through which PBL curricula are envisaged, such connections happen to be pervasive. Multigenerational and multicultural dimensions are included in these curricula resulting in community resources interference. EE serves as a connection between the environment and people and also empowers people (learners) to be able to identify and address environmental problems through that connection.

PBL uses a value-driven approach allowing for the accomplishment of ecological and cultural literacy, conservation and community stewardship objectives. This approach has been designed with the goal of advancing educational goals as well as objectives that have been identified locally (Knapp, 2014). This contributes to the adaptation of skills, stewardship perspectives, action, restoration, innovation and reconnections of human communities and natural systems (Semken et al., 2017). This implies that the

integration of EE themes improves connections between the natural systems and people in that community. It is the researcher's view that an increase in learners' involvement and enthusiasm can be seen through the connection of learning and local context by schools. This can be achieved through partnerships of those schools with the local environment, (Semken et al., 2017*)*. This implies that when there is learners' involvement in community work, a new level of addressing environmental problems is taken by schools. This view was supported by Smith and Sobel (2014) who alluded that PBL breaks the barriers between schools and communities. The community then shows support for schools, financially and provides resources such as public land which improves the integration of EE in those schools and therefore improves the academic achievement of learners (Gruenewald, 2014). Smith and Sobel (2014) state that PBL has the potential to help learners to learn better as it avails that particular land and community's complete suite of learning.

PBL also includes various practices in education that include but are not limited to teaching to numerous intelligence, brain-based learning, collective learning and differentiated instruction (Knapp, 2014). This allows teachers' re-invigoration, strengthened community connections and transformation of school culture. Teachers integrating PBL have been reported to be highly satisfied with their jobs and community networks and this contributes to solutions for difficult national problems (Demarest, 2017).

The PBL framework has the ability to change the education system in the adoption of the current interdisciplinary method, which is based on action research instead of an out-of-date industrial, input-output linear model (US Census, 2010). It is there-searcher's view that the Place-Based Model (PBM) can create opportunities for learners to think independently for data collection, and analysis and to synthesize, and critique information. This exercise can also create the opportunity for learners to acquire knowledge and innovative ideas, solve community problems, create knowledge and develop advanced ideas. In supporting this view, Knapp (2014) echoes that the place-based model is useful in improving learners' communication skills through writing reports and sharing findings with others in the class.

This study employed PBL to explore teachers' integration of CAPS EE themes with local environmental problems. Smith and Sobel (2014) indicates that PBL seeks to

identify the local environmental or ecological problems with the intention of addressing them. This implies that, for effective teaching and learning of EE themes, learners should be exposed to their local cultural, historical, socio-political, and other environmental problems (Semken et al., 2017).

2.2.2 Social constructivism theory

Social constructivism (SC) is a learning theory that was developed from the ideas of Vygotsky (1978). It is a learner-centered approach that pays attention to what the learner knows, allowing them to put their knowledge into practice (Kiraly, 2014). SC is a theory in which the knowledge and understandings of the world as a whole are examined (Kiraly, 2014) by individuals through the development of meaning and significance. The elements of SC are numerous and include the assumption that human experiences are rationalised through the creation of a social world model and the belief that language is essential in reality construction.

Numerous contemporary theories are associated with SC, especially Vygotsky and Bruner's theories of development and Bandura's social cognitive theory (Muniyappan and Sivakumar, 2018). According to Edwards, Fenwick, and Sawchuk (2015) reality assumptions, knowledge and learning are the basis of SC. According to the view of the researcher, teachers need to know the premises underlying the models of instruction before applying these models. This implies that it is essential for teachers to have a background on EE (understanding).

According to Edwards *et al*. (2015), the reality is regarded as the first assumption of SC which is constructed through human activity without existing in advance. Woollard and Pritchard (2013) add that the properties of the world or group are invented by members of a particular society or group together. Furthermore, SC is firm on the idea that reality cannot be discovered by individuals since it is not made before the social invention. This implies that the integration of EE themes in CAPS subjects can expose learners to the reality of their local environmental problems and encourage them to solve them. SC sees knowledge as a product that humans develop both socially and culturally (Edwards *et al*., 2015). This means that through interaction with the environment, learners can easily find the meaning of the importance of their local environment. Learning cannot be developed passively by external forces but is a

social process and takes place in both individuals and groups (Edwards *et al*.,2015). SC states engagement in social activities often follows that meaningful learning (e.g., interaction and collaboration). It maintains that learning is a process of constructing meaning through experimenting (Florian & Spratt, 2013). In the context of this study, SC allows for qualitative analysis that reveals insights necessary for teachers to integrate EE based on how learners interact with the real world and it also serves as a useful theoretical framework (Florian & Spratt, 2013). The integration of EE themes with CAPS subjects is required in order to equip teachers with better teaching and learning methods.

The importance of teachers and learners to share knowledge about environmental issues with members of the community frequently cannot be overemphasised. Aminehand Asl (2015) concur that SC encourages teachers and learners to work together using social media to share knowledge and expertise. In the current study, the researcher investigated teachers' perceptions of EE integration in grade 10 with the intention of resolving local environmental problems. SC allows learners to relate to circumstances through cognitive growth that initially occurs on a social level which promotes individuals' sense of others and constructs knowledge in the process (Amineh and Asl, 2015). Amine and Asl (2005) also add that the origin of individuals' knowledge is through the interaction with their environments and other people with the same level of knowledge. This implies that learners can acquire new knowledge and experiences through the integration of EE themes in CAPS subjects. Fieldwork can benefit learners through interaction and engagement with local members on how to solve local environmental problems. Wollard and Pritchard (2013) add that SC is based on culture and the understanding of what usually happens in society.

The importance of engaging learners during teaching and learning cannot be overemphasised. Rosen and Mannyikan (2011) and Wollard and Pritchard (2013) emphasise that according to the learner-centered approach, the cognitive level of learners is easily engaged when learners are exposed to hands-on projects. This study focused on teachers' integration of EE in other CAPS subjects through activities and/or projects that are hands-on. It is the researchers' view that learner-centred EE activities promote

their problem-solving skills. This view is supported by Wollard and Pritchard (2013) who indicate that SC plays a role in expanding learners' vision and the ability to construct social meaning.

Different perspectives inform how learning and teaching should be facilitated in SC. One is the pragmatic or emergent approach which asserts that classroom teaching and learning should be developed following or as a response to the need arising (Wollard and Pritchard, 2013). According to this approach, the views of the individual or collection of the whole class can address knowledge, meaning, and understanding of the world (Wollard and Pritchard, 2013).

2.2.3 Outdoor experiential learning

According to McLeod (2013), the open nature of outdoor experiential learning (EL) makes it difficult for one to define it. Numerous activities can be regarded as experiential, however, they may not be depending on how they are carried out. Moon (2013) defines experiential learning by its difference to conventional academic instruction and also highlights what it is not. Something cannot be declared experiential due to its participation in a prearranged set of learning experiences. This method is not linear, cyclical, or even patterned but a series of working principles. These principles must be all present as they are equally important during experiential learning. Alsamani (2016) defines experiential learning as a process that is based on the pedagogical principle of learning through action as it requires action for learners to gain knowledge.

There is a connection between the teaching of the integrated EE themes into CAPSA and experiential teaching methods. These methods include debates, role-play, simulations, experiments, and many others. The learning process is guided by inquiry facilitation (Markaki, 2014). McLeod (2013) indicates that outdoor experiential learning activities should include theory and experimental activities. In other words, there should be a balance between theoretical knowledge acquired in class and practical experience. Learners should be fully involved in creating meaning out of theoretical knowledge and practical experimentation. This requires learners' full involvement and not just following instructions. This, in turn, allows them to be accountable for their actions and own the consequences.

The effectiveness of teaching/learning methods depends on many factors (Kolb, 2014) with their application assessed through various teaching/learning environments and other different circumstances. According to Kolb (2014), learners benefit more from experiential teaching methods as they are more relevant to them. The outdoor learning/experiential learning theory promotes the teaching and learning that takes place outside the classroom (McLeod, 2013). However, this requires trained teachers who know how to integrate EE themes into CAPS subjects, to implement and to manage outdoor learning activities which will also promote thinking and to help to construct meaning through experimenting. According to McLeod (2013), in Kolb's theory, learning comprises of the gaining of abstract concepts that can be used flexibly in various situations. In this study, the impetus for the development of new concepts provides new experiences. Kolb (2014) indicates that EL involves a four-stage learning cycle, namely: concrete experience, reflective observation, abstract conceptualisation and active experimentation in which the learner touches all the bases.

The qualities of experiential learning can also be used to define it. Markaki (2014) states that the connection between EE and experiential teaching methods builds a solid life-long learning system through which learner participation is most often encouraged in addressing environmental problems. Experiential methods can build environmentally cautious learners with environmental values and can inspire them to adopt new ways of thinking (Markaki, 2014). Through this collaboration between teachers and learners and the enhancement of learners' skills such as problem-solving and scientific literacy are developed.

Experiential learning builds learners' confidence and allows for the growth of other skills like individuality which in turn enhances positive attitudes toward learning (McLeod, 2013). This way learners understand the natural world and its problems better as they are interested in what they are learning (Markaki, 2014). Successful experiential learners are enthusiastic to reorder or change their view of a certain theme or topic (Markaki, 2014); they are independent thinkers who can justify their views. They ensure that, as they undertake tasks, they clarify their purpose and possess relevant necessary skills. Such learners are not only open-minded but are able to work with other people's views and are aware of regulations.

According to Moon (2013), it is the responsibility of the learner to manage their own learning in experiential learning. The learner is not dependent on the instructor and the instructor has less responsibility. The learning process may take place in other environments and not only the classroom and may not always require the use of textbooks. (Moon, 2013). The integration of EE in experiential learning may mean that the learner has to identify and acquire certain knowledge about their environment that has not yet been identified clearly by the curriculum.

Piercy (2013), outlined two categories of experiential learning: field-based experiential (FBE) and classroom-based experiential (CBE). The oldest of the two is FBE. FBE was introduced around 1930. FBE evolves around service learning, internships, and other related concepts; CBE has many forms that include role-playing, presentations, and many others. This implies that the integration of EE in the CAPS curriculum through EL theory gives learners the opportunity to learn using different methods.

2.2.4 Connectivism

Connectivism is associated with two proponents, one of which includes Stephen Downes, an online learning technology specialist. Downes has contributed to the areas of online learning, content syndication, and new media for the National Research Council, Institute for Information Technology, in Moncton, New Brunswick, Canada. He (in Siemens and Jansen, 2014) describes connectivism as interactive knowledge in a system. This implies that integrating EE themes in CAPS subjects would be embedded in a connection between knowledge and the actual environment.

Networking is one of the most important concepts of connectivism where knowledge is passed from generation to generation by both humans and non-human (artifacts). With regard to the passing of knowledge between humans and non-humans (technology), Siemens (2015) sets a bold research agenda, dealing with rapid changes in the information revolution together with the effects of theories of networks, complexity, and confusion. He highlights the guiding statements of the principles of connectivism: learning takes place through an interactive connection within a network between humans and the environment; learning is a process where information sources are

connected to the environment, and learning and knowledge are based on diverse opinions. Therefore, learning of EE may also be taking place in connections and through continuous learning which keeps one up-to-date.

2.3 COMPARISON OF ALL FOUR DISCUSSED THEORIES

What differentiates the four theories is that the effectiveness of the teaching/learning of each theory depends on different factors. Learning and teaching in PBL require the community and re-integration of the learner. Knowledge of the social, cultural, and natural environment is necessary to gain knowledge and skills (Gruenewald, 2014) regarding the local environment. In connectivism, learning takes place through an interactive connection within a network between humans and the environment. Outdoor experiential learning is learning that involves action as learners learn the following experience or doing something new. SC advocates a learner-centered approach that pays attention to what the learner knows and allows the learner to put his/her knowledge into practice.

These theories can be further differentiated by their principles. The principles of PBL indicate that learning is based on particular attributes of a place including its geography, politics, sociology, ecology and other dynamics of the place. The principles of connectivism are based on the fact that learning is involved with the connection of information (Siemens, 2015). Experiential learning activities give learners the opportunity to learn through the experience of the world. Outdoor experiential learning can be applied in all the other theories as learning can take place by engagement in the social, cultural and natural environment of a certain place (PBL), through learners' interaction with the environment (connectivism) or through creating a model of the social world (SC).

2.4 THEORY FOREGROUNDING THIS STUDY

This study is foregrounded by experiential learning theory. According to Daskolia, Dimos, and Kampylis (2012) experiential theory facilitates learners giving them the opportunity to have a relationship with nature which then leads to increased receptivity to environmental. Wurdinger and Carlson (2010) stated that with EE, any learning environment has the ability to be an experiential learning area. These include areas such as the school yard, as well as

the local environment. All environments are useful depending on the theme being tackled for example for the flora and fauna and recycling, the yard can be very useful.

2.5 CONCLUSION

In the chapter focused on the theories foregrounding the integration of EE themes into CAPS (place-based theory, social constructivism, outdoor/experiential and connectivism), the comparison of all four theories and theory foregrounding this study (experiential theory).

CHAPTER 3
LITERATURE REVIEW

3.1 INTRODUCTION

Teachers have different views regarding the integration of EE themes in curriculum subjects. This chapter aims at discussing the extent to which teachers are trained or empowered to integrate EE themes into CAPS subjects and at exploring the success and challenges of integrating EE themes. The discussion rests on a review of the general literature and the outcomes and recommendations of other authors.

3.2 DEFINING EE

EE has been given numerous definitions and labels. The first pronouncement on EE was given at the world's first intergovernmental conference on environmental education in 1977, known as the Tbilisi Declaration. EE was seen as a progression of learning whereby people's environmental knowledge, challenges associated with it and how to deal with such challenges is increased (Ghosh, 2014). This view stresses the ongoing nature of EE. Tal and Abramovitch (2013) mention that EE will always be a subject of exploration, speculation, and debate. Salleh *et al.,* (2016) consider EE a transparent way to environmental realisation with the aim of ensuring growth and sustainability. Gough (2013) views EE as the process of producing citizens with knowledge of the biophysical environment and the problems associated with it. Liefländer *et al.* (2013) view EE as a recognition process of values and the clarification of concepts for the development of skills necessary to understand interrelatedness amongst human beings, culture, and bio-physical surroundings.

3.3 HISTORICAL BACKGROUND OF EE

Numerous authors have studied the history of EE. In the past education was given minimum attention with regard to raising the consciousness of problems of the environment and development (Obasoro, Oyinloye & Ilesanmi, 2012). Societal transition due to science and technology and the effects it has on the environment are the reasons

behind the introduction of EE with the aim of controlling such problems (Osbasor *et al.*, 2012).

EE was endorsed in the recommendations of a conference held in 1972 by the UN in Stockholm which focused on people and the environment (Ciroth *et al.*, 2011). The Stockholm Declaration recognized an interdependency or connection between people and the environment (Lozano, Lukman, Lozano, Huisingh and Lambrechts, 2013). The Stockholm Declaration is among the first documents discussing inter- and intergenerational justice among people. Twenty-four (24) principles with the intention of attaining environmental sustainability and underlining bilateral and multilateral measures were recorded in the declaration; most of them focus on legislation and one (principle19) states the necessity of EE from earlier stages of life to adulthood (Lozano *et al.*, 2013).

In 1975, the Belgrade charter (building upon the 1972 declaration) identified the general public as the principal audience of EE to ensure that all people are responsible for EE (Lam, 2011). Consequently, EE was included in the curriculum in 1976 (Ciroth *et al.*, 2011). As already mentioned above in 1977, the first international UNESCO conference was held and issues the Tbilisi declaration where it was recommended that EE be lifelong, integrated, active and inclusive. This study investigated whether this aim for EE as propounded by Tbilisi is indeed realised in the schools around Thohoyandou. Lozano *et al.,* (2013) consider the Tbilisi declaration as one of the initial points for prescribed international EE initiatives. The objectives of the Tbilisi declaration were: Awareness: To assist in building awareness of individual's and social groups on the environment and the problems that were associated with the environment; Sensitivity: to help people gain understanding and experience in the environment and problems allied to the environment; Attitude: Assist individuals and communal groups to attain feelings and environmental value so as to improve their participation in protecting the environment; Skills: to identify and provide skills required in solving environmental problems; Participation : To promote participation of people in working towards a resolution for environmental problems. In the same year, the Belgrade charter was presented at an inter-governmental conference of EE at the Republic of Georgia (O'Byrne, Dripps and Nicholas, 2015). Another significant document that emphasized the use of resources through sustainable development was launched by

the World Conservation Strategy (WCS) in 1980 (O'Byrne, Dripps and Nicholas, 2015). Endorsements of EE were later revised in Moscow to focus on institutional strategies and action plans to reinforce EE in 1987 (Lotz- sisitka, 2012). In 1997, there was another international conference in Greece where the need for EE in backing sustainable development was the centre of debate (Lotz- sisitka, 2012). Another international conference (the third) was held in Greece in 1997 and continued the debate. Years later (2005-2014), the UN Decade on Education for Sustainable Development was introduced following the World Summit on Sustainable Development in 2002 (Lotz-sisitka, 2012). The fourth international conference produced the Ahmedabad declaration in 2007. The aim of this conference was to reaffirm the recommendations for the third conference.

3.4 ENVIRONMENTAL EDUCATION IN SOUTH AFRICA

Irwin (1990) states that EE was initiated by non-government conservation agencies together with state agencies in South Africa. The introduction of EE in South Africa was motivated by both the Belgrade Charter of 1975 and the 1977 Tbilisi Principles (Lotz-Sisitka, 2012). However, Tselane and Mosidi (1998) state that the interest in EE started in the 1960s and in 1989 an attempt to include it in the curriculum was initiated. Tshautshau (2013) states that the concept of EE is recent in South Africa.

In 1982, South Africa held its first EE international conference in Kwazulu Natal. The results of this conference were the launch of the Environmental Education Association of Southern Africa (EEASA) and EE courses and programmes in higher education institutions. Le Grange (2002) states that the introduction of the EE Policy Initiative (EEPI) in South Africa took place in 1992 to gather and develop EE policy. This resulted in the addition of EE in the White Paper on Education and Training (WPET) as one of the key principles of education and training policy in South Africa. This was then followed by the coordination of Policies and Procedures through an investigation by the EEASA to ensure development in education curriculum policy.

After the first democratic elections in South Africa in 1994 many changes occurred in the country such as the emergence of new policies including Education and Environment policies (Le Grange, 2002). The emergence of this policy was due to the realisation that South Africa was faced with severe financial, communal, political,

ethical, traditional and environmental challenges. The Bill of Rights affirmed the right of every citizen to a healthy environment (RSA, 1996). This meant that the country's resources were to be used in a sustainable manner and that the government had to ensure that every citizen has access to natural resources (RSA, 1995).

The South African Reconstruction and Development Programme (RDP) proposed the need for committed teachers and trainers to reach the goal of a healthy environment through understanding and flexible responses following the new strategies to curriculum, technique, delivery, and authorization required by the transformed structure of education and training (Le Grange, 2002). This study also investigated the commitment of teachers in schools around Thohoyandou in the implementation of EE.

The White Paper on Education and Training (WPET) (1995) stated: EE, comprising an interdisciplinary, combined and lively approach to learning, should form part of stages and programmes of the education and training system. This was aimed at developing people who were knowledgeable of and involved in the functioning of their environment to guarantee that all South Africans would enjoy quality life by using available resources sustainably (RSA, 1995).

Such an introduction of EE themes is urgent given the scourge of many environmental problems: pollution, land degradation and deforestation that are still common in many of our communities especially the poor (Tshautshau, 2013). Even though the concept is said to be new, the integration of EE themes in different subjects at schools is advocated for by different national educational frameworks (Tshautshau, 2013).

3.5 THE INTEGRATION OF EE THEMES

EE themes are integrated into different subject groups at the secondary level. These groups include sciences, humanities, languages and cultural and technological subjects (Lam, 2011). The nature of the themes depends on the subject, for example, chemistry, life sciences, and physical science have their focus on living and non-living factors impacting on the environment; the humanities and social sciences have topics that cover both people and environment (Lam, 2011).

A study that was intended to establish EE themes mainstreamed in the curriculum of the school conducted by Kimiti and Kipkoech (2013) in Kenya, yielded results indicating that EE in secondary schools dealt with broad themes which comprised of: the earth, geographical features, farming, mining and the impact of people on the environment. In the same study, geography was found to be a core subject in both grades 8 and 9. The authors proposed that EE themes should be covered by learners who chose geography in the senior phase (grade 10-12).

Hebe's (2017) study found that economics and management sciences were the subjects in which most teachers could integrate EE themes most easily compared to other subjects. This study established whether themes that are infused in the subjects that are being investigated are taught effectively. Further investigation was done to establish what challenges affected effective teaching and the views of teachers on the integration of EE themes in these subjects (Hebe, 2017). In the same study (Hebe, 2017) it was also found that the EE theme, Population, was taught the most frequently compared to other themes and Biodiversity was taught the least. The frequency with which teachers chose to teach a theme depended on how relevant they felt it was to their learning area. This study investigated other reasons why teachers choose a certain environmental theme more or less regardless of the relevance of the themes to their learning areas.

Mokhaba (2009) indicated that some teachers perceived certain EE themes as unimportant due to the location of their schools. For instance, teachers were less interested in themes such as waste and pesticides because they were from underprivileged areas where less waste is generated because local residents could not afford to purchase

things that result in waste. However, the small amount of waste produced in that underprivileged area was poorly handled and contributed to health hazards for people and animals (Hebe, 2017). Hence, many diseases like cholera were rapidly picked up in such areas. The aim of the current study was to investigate if teachers are able to integrate all EE themes in their subjects.

3.6 Approaches used to teach EE themes in the school curriculum

Many approaches can be used to teach EE in the school curriculum. Lotz-Sisitka and Raven (2001) believe that for learning to be successful, it requires the use of active learning approaches such as active learning, critical thinking, and participation in the practical world. Teaching approaches can be categorised as either direct or indirect (Kimiti and Kipkoech, 2013). Olembo (1990) further states that the effectiveness of the implementation of the school curriculum depends on the use of appropriate teaching approaches and suggests that learners' understanding is enhanced through teaching methods that boost learner's participation.

3.6.1 Direct strategies

Direct teaching methods mainly focus on the teacher stating the goals of the lesson, monitoring learners' understanding of the content and are teacher-centered (Ruutmann & Kipper, 2011). Examples of direct methods as lectures and guest speakers used to mainstream themes of EE.

3.6.2 Indirect strategies

Indirect teaching approaches are learner-centered (Ruutmann and Kipper, 2011). Examples of indirect teaching methods are the question and answer method, group discussions, problem-solving, field excursions and the project method.

3.7 ASSESSMENT OF TEACHING APPROACHES BY OTHER RESEARCHERS

A study conducted in Nigeria and Malaysia by Mustam and Daniel (2018) indicated that Malaysian teachers were more competent in teaching EE because they adopted better teaching methods. This study stated direct teaching approaches as better teaching methods.

The findings of a study conducted by Kimiti and Kipkoech (2013) revealed indirect methods as the most suitable for EE; this included methods such as group discussions, question and answer, and experimental methods as they enhanced learners' understanding of the content. However, the lecture method was found to fail to promote learners' understanding of the content being taught. However, most teachers preferred lecturing when teaching large classes. Ketlhoilwe (2013) also supported the use of indirect learner-centered, participatory and active learning methodologies and gave examples, such as role-play, active learning, investigation/ experiential learning, group work, presentations, demonstrations, theatre, and television. Contrary to this, teachers in Obuka Ward–Mkhandlwini Cluster were found to prefer using direct methods (Hebe, 2017).

Kimiti and Kipkoech (2013) also noted the frequent use of the guest speaker approach on EE themes in the non-formal curriculum. Conversely, Ketlhoilwe (2013) found that guest speakers often were used to teaching the formal curriculum and were rarely applied in the non-formal one. This study investigated teaching approaches that are used in integrating EE Education themes in schools around Thohoyandou and their effectiveness.

3.8 THE SUCCESS AND CHALLENGES IN INTEGRATING EE THEMES IN CAPS

In most cases, foreseeable obstacles for teachers integrating EE are due to a lack of pedagogical skills, knowledge, and experience. Teachers with more experience are likely to acquire required skills rapidly and seamlessly as compared to teachers with little or

no experience in teaching (Gosselin *et al.,* 2016). Ormond (2017) maintains that curriculum integration requires a high level of discipline, knowledge, and expertise from teachers. Due to a lack of pedagogical knowledge on the part of teachers, they may not know how to integrate EE themes in CAPS subjects. EE is focused on the environment, learning in and through the environment and ways to benefit the environment (Gosselin *et al., 2016*).

3.8.1 The part played by the teacher

Effective realisation of the objectives of the education system is hampered by a shortage of teachers, lack of maintenance of schools, lack of relevant resources resulting from poor funding, poor organization and improper policy implementation. Deficiency in the curriculum and syllabus of the school result in inadequate knowledge of environmental issues and problems. The introduction and co-ordination of innovative educational policies (e.g., EE) in the school curriculum and syllabus expose learners to environmental issues and empowerment endeavours so that they become part of the solution for such problems.

3.8.2 Funding of the system

Adequate funding is an essential element in the enhancement of integrating EE in the school curriculum. Poor funding of education does not only affect learners but also teachers as it makes it difficult for them to transmit knowledge to learners. Outcomes of poor funding include dilapidated buildings and a shortage of materials. Factors that lead to the success of the integration of EE themes include consistent payment of income, rewards and remuneration, suitable equipment (up-to-date laboratory, necessary equipment that is well maintained), well-constructed classrooms and other basic services.

3.8.3 Changes in curriculum

The government and educational planners both have a role to play in the integration of EE in the school syllabus. Following the objectives of EE, there is a necessity for experts

to share knowledge and train teachers in order for them to understand the new programmes. The realisation of the objectives of the new policy is dependent on programmes that are designed for teachers together with enthusiasm and commitment from the government.

3.8.4 Change in attitude

Attitude is also a determinant in the success of EE. This does not only include the attitude of teachers and learners but also of the public in general and influential members of the community. Positive attitudes lead to increased support of EE in the school syllabus by community members who can assist in meeting the requirements and challenges resulting from ongoing scientific developments and technology which have an intensely negative effect on the environment. EE is a necessity in the development of a healthy and sustainable society. Numerous current environmental problems are a result of unfamiliarity with basic ecological facts, which is usually transferred from generation to generation resulting in learners' negative attitudes towards EE which affects not only the integration of EE themes in subjects but also the environment. This requires money and courses that are accurate and accurately designed to raise public awareness and to ascertain that the future generation has a positive attitude, understand and value the environment.

3.9 TEACHER EMPOWERMENT IN THE IMPLEMENTATION OF EE

Le Roux and Ferreira (2005) suggest that EE is not the responsibility of certain subject teachers but of all the teachers at school. Thus, programme designed to empower teachers should be introduced. Schudel (2014) discusses teacher empowerment under the following headings as presented in the next sections.

3.9.1 EE Policy Initiative (1992-1995).

The EEP initiative was participatory and aimed to incorporate numerous EE elements and subjects.

3.9.2 EE Curriculum Initiative (1996-2000)

This refers to the debate and definition of EE that was achieved through a partnership between the Department of Environmental Affairs and Tourism, the education departments (provincial) and different EE practitioners in C2005.

3.9.3 National EE project: General Education and Training (NEEP-GET) Implementation

This donor-funded initiative was intended at developing curriculum advisors and teachers professionally for the successful implementation of EE. The NEEP-GET tasked EE co-coordinators in South Africa (with all province represented) to ensure the projects' sustainability. Hebe (2017) questions if this has been done. This study investigated the effectiveness of training provided for the integration of EE themes and other strategies designed/develop to improve/assist in the integration of EE in schools around Thohoyandou.

3.10 EE AND THE CHANGING OF CURRICULUM

The South African education system has undergone curriculum reform and modifications since the country emerged from the apartheid past and embraced democracy. The first outcomes-based education curriculum was introduced in the year 2005 (C2005) and a revised *National Curriculum Statement* (NCS) was later introduced for the integration of EE in the school curriculum. In the C2005, EE was a phase organiser and not a subject which meant that teachers had to engage with it by considering an environmental focus in their teaching (Schudel, 2014).

The revised NCS encouraged an emphasis on content that is not only subjects-related but also has its focus on the knowledge necessary to maintain outcomes and integration balance (Gough, 2013). The recognition of the relationship between community justice, a sound environment, people's rights, and involvement is one of the many principles of NCS (Schudel, 2014).

Later, the NCS was revised as the Curriculum and Assessment Policy Statement (CAPS) in 2010. Such change of the curriculum brought about significant changes in the schooling landscape which include: a recent highlighting of content knowledge, pacing, and sequencing of CAPS which is seen to be well organized when compared to previous curricula (O'Donoghue, 2013). The curriculum still promotes commitment to active learning and focuses on environmental content in different learning areas (subjects) (Tshautshau 2013). In the CAPS, knowledge for processes of Education for Sustainable Development (ESD), is required for the development of lessons related to environmental sustainability.

Mnguni (2013) questions whether curriculum improvements in South Africa have the ability to address present social challenges immediately by empowering learners. Mnguni (2013) indicates that it is often the responsibility of the curriculum designers to prepare and then the approval is given by authorities for implementation by the institutions. This implies that educators often have no say on how such a curriculum is conceived and prepared or planned but they have to implement it. Due to the complexity of the curriculum, educators face various curriculum statements and goals that they have to interpret according to their understanding (Mnguni 2013). The current study was aimed at investigating the effectiveness of the integration of EE themes in grade ten subjects in schools around Thohoyandou in the CAPS and the challenges associated with it.

3.11 CONCLUSION

This chapter covered the following topics: Overview, research design, research paradigm, population and sampling techniques, inclusion criteria, data collection data analysis, trustworthy, ethical considerations, possible contributions of the study, limitations, and challenges of the study, dissemination of findings and conclusion.

CHAPTER 4
RESEARCH DESIGN AND METHODOLOGY

4.1 OVERVIEW

This chapter outlines the research design and methodology to be applied for this study. In order to outline the research design and methodology of this study, the following sub-headings were discussed, namely: research design, research paradigm, research approach, population and sampling techniques, data collection method, data analysis, ethical considerations, limitations of study and dissemination of findings.

4.2 RESEARCH DESIGN

The research design is the overall strategy to be employed logically in a particular study to address a research problem and or question (Best and Kahn, 2016). The purpose of the research design in this study is to specify a plan to enable the researcher to generate empirical evidence that will be used in answering the research questions. There are three approaches that are used in research namely: qualitative, quantitative and mixed-method. Rubin and Babbie (2016) indicate that there are three main categories of research approaches, namely, the qualitative, quantitative, and mixed-method approach. The qualitative approach focuses on an in-depth understanding of the research problem (Rubin and Babbie, 2016). It refers to the meanings, concept definition, characteristics, symbols, metaphor and description of things (Best and Kahn, 2016). The quantitative approach deals with observational phenomena through statistics, mathematics and computational techniques (Rubin and Babbie, 2016). The mixed-method is a combination of both the qualitative and quantitative approach (Rubin and Babbie, 2016).

For the purpose of this study, a qualitative research approach was employed. Contrary to the other research designs, the qualitative approach rests on the assumption that knowledge is socially constructed as individuals are inclined to understand and make meaning of the world they live in (Babbie, 2014), hence this study adapted qualitative approach since it probes teachers' perceptions of EE integration in grade 10 subjects in selected Thohoyandou secondary schools.

The qualitative research approach has different designs which include ethnography, phenomenological, grounded theory and case study design. Ethnography involves - searchers immersing themselves in their target population's environment in order to understand their goals, challenges, cultures and many other aspects of their lives (Sokolowski, 2017). It has its roots in cultural anthropology and can be carried out in the form of interviews or surveys (Best and Kahn, 2016). In a phenomenological study, the researcher seeks to describe an event, activity or phenomenon (Sokolowski, 2017). In this type of study, a combination of methods such as interviews, document analysis, and observations can be used (Sokolowski, 2017). A grounded theory study is aimed at providing explanations or theory underlying certain events (Best and Kahn, 2016). A case study is a study design that involves the organization of data for the purpose of analysing a problem from an individual, group or institution (Rubin and Babbie, 2016). For the purpose of this study, a case study design was adopted. According to Creswell and Clark (2017), a case study involves an up-close in-depth and detailed examination of the subject being studied which makes it more suitable for this current study as the researcher aims at obtaining an in-depth understanding of the integration of EE themes.

4.3 RESEARCH PARADIGM

According to Walker (2012), a research paradigm is a belief system or theory that guides how the research will be carried out. There are different research paradigms that represent the different ways of seeing the world, which include but are, however, not limited to positivism, interpretivism, and post-positivism. The positivism paradigm states that in order to understand why humans behave the way they behave, one has to observe and reason (Walker, 2012). In positivism, human behaviour is believed to be passive and influenced by the environment they live in (Easterby-Smith, Thorpe and Jackson, 2012). This implies that positivism or the positive attitude of teachers would influence their integration of EE themes into other CAPS subjects. When teachers have positive attitudes, they put all their energy into integrating EE themes in their subjects allowing learners to learn as much as they can. The theory foregrounding this study is experiential, which requires the engagement of learners, therefore this would encourage learners to experiment as much as possible and the process of learning would run smoothly.

Interpretivist paradigm states that reality is based on the subjective experiences of people (Walker, 2012). De Vos, Strydom, Fouché and Delport (2016) also indicated that the interpretive paradigm elicits participants' accounts of meaning, experience or perceptions. Individual teachers are to reflect on their actions and experience of integrating EE themes in CAPS subjects (Creswell and Clark, 2017). When teachers interpret the methods of integrating EE themes into CAPS subjects, they gain more understanding of such, which enhances their proficiency in integrating such themes into their CAPS subjects. When learners interpret their theoretical knowledge and their experiential learning, they understand their environment better and the learning process occurs. The Interpretivist approach was employed in this study since it seeks an individual's understanding of his/her world and also develops the subjective meaning of his/her experiences (Creswell and Clark, 2017).

The post-positivist paradigm is a theory that brings about liberation through engagement in social, cultural and political activities so as to bring about a reformation in the education system (Easterby Smith *et al.*, 2012). The integration of EE equips learners with the necessary knowledge to empower them to bring about necessary changes so as to conserve their environment.

This study is grounded in the interpretive paradigm as it is concerned with teachers' views regarding the integration of EE themes in curriculum subjects. The discussion in the subsequent paragraph handles the research design of the study.

4.4 POPULATION AND SAMPLING TECHNIQUES

4.4.1 Population

A population is a group of elements, cases or individuals that conform to specified criteria and to which researchers intend to generalise the findings of the research (Rubin and Babbie 2016). The study population is all teachers integrating EE themes in grade 10 subjects.

4.4.2 Sampling

Sampling is the process of selecting participants who are to be part of a study (Best and Kahn, 2016). There are main methods of sampling strategy namely: probability sampling and non-probability sampling. In probability sampling, all individuals stand an equal chance of taking part in the study and the results of the study can be generalized as it reflects the entire population (Best and Kahn, 2016). Types of probability sampling are simple random sampling, stratified sampling, cluster sampling and systematic sampling (Babbie, 2014). In non-probability sampling, there is no equal chance of participating in the study and the participants are chosen based on the judgment of the researcher (Glense, 2015). Examples of non-probability sampling are convenience sampling, snowballing, purposive sampling and quota sampling (Rubbin and Babbie, 2016).

Convenience sampling involves the selection of elements or individuals that are available at that moment or at the place the researcher is interested in carrying out the study or can access with ease (Rubin and Babbie, 2016). A convenient sampling technique was used to select schools. This method was adopted schools are located in proximity to the researcher. There are nine (9) secondary schools in the Dzindi circuit. Hence the researcher chose a sample of five (5) schools which is over fifty percent (50%). Through the use of purpose sampling, ten (n=10) teachers were chosen as participants in this single case study. Convenient purposive sampling as a form of non-probability sampling in which units to be observed are selected on the basis of the researcher's judgment about which will be the most useful or representative (Rubin and Babbie, 2016). This method was adopted because the researcher wanted to carefully select teachers of specific grade 10 subjects who are integrating EE themes in those subjects. In addition, in this study other criteria used to select teachers and schools were as follows: teachers received training on the integration of EE themes in other CAPS subjects, and schools have EE awareness programmes that are linked to the local community to raise the level of EE awareness.

The study took place at selected Thohoyandou secondary schools which are under the jurisdiction of the Vhembe District in the Limpopo Department of Education. The schools found in this area are non-fee paying schools and are totally dependent on the government for funds.

4.5 INCLUSION AND EXCLUSION CRITERIA

According to Rubin and Babbie (2016), inclusion criteria describe the set of characteristics that are used to identify subjects/participants to be included in a certain study. For this study, all teachers who integrated EE themes in secondary schools in grade 10 subjects at the Dzindi circuit and who have been teaching for more than a year were included. According to Rubin and Babbie (2016), exclusion criteria describe the set of characteristics that are used to identify subjects/participants who are to be excluded from a certain study. Grade 10 teachers who had less than a year's experience and who have just been transferred to grade 10 were excluded in this study.

4.6 DATA COLLECTION

Data collection is a process of gathering and measuring information on variables of interest, in an established, systematic fashion that enables one to answer stated research questions, test, and hypotheses and evaluate outcomes (Glesne, 2015). In this study, data was collected from five (n=5) secondary schools. The process of data collection commenced after school when the teachers are available so as to avoid disturbing the process of teaching and learning during school hours. According to Glesne (2015), the term data collection instrument refers to any plan of action that helps the researcher in gathering the relevant data. Data were collected using three research instruments, namely semi-structured interviews, document analysis, and non-participatory observation. Qualitative research seeks to obtain in-depth understanding of the phenomena being studied (Glesne, 2015), hence the researcher chose the semi-structured interview since it gives participants the opportunity to give as much information as they know about the subject being studied (Glesne, 2015); observation which allows the researcher to explore other relevant factors related to the subject; and document analysis which provides views of other authors/researchers.

In conducting the interviews the researcher used interactive questions for emphasis and to check the validity of the responses provided by the participants. In these face-to-face, semi-structured interviews, the researcher interviewed the sample participants using an interview guide (Appendix D) that was developed following

research questions and also guided by literature review. The interview guide consisted of four main questions: demographic information, methods and/or approaches used in teaching and learning, the success and challenges that teachers encounter when integrating EE themes; and strategies to enhance teacher proficiency in integrating EE themes into their subjects. For semi-structured interviews, appointments were made with teachers to visit them at school when they are available and the consent form was signed by participants in order to record them during the interview using a digital tape recorder.

Viswambharan and Priya (2016) state that document analysis involves the interpretation of documents by the researcher to give voice and meaning around the problem being investigated. For the purpose of this study, the researcher went through documents with information related to the integration of EE themes into other CAPS subjects. A rubric (Appendix E) was used to review documents. The following documents were analysed: CAPS subjects' policy documents, lesson plans, and assessment activities.

The last instrument used for data collection is non-participatory observation. Non-participatory observation is a technique of data collection where the researcher observes the participants while they teaching, with their knowledge but without being involved in the situation (Best and Kahn, 2016). The researcher visited sampled schools and observed teachers as they taught during the selected subjects' period to observe how they integrated EE themes in those subjects using an observation schedule that was researcher-developed. The researcher arranged with the teachers to visit them during lessons so as to observe them on duty. Factors observed were teachers' ability to integrate EE themes during teaching, the teaching approach and assessment activities given to learners.

The triangulation of the data collection method in order to get the most relevant information was achieved through the use of non-participation observation, semi-structured interviews, and document analysis. Non-verbal information was captured through the re- searcher's observation and this observation provided information that facilitated a clear understanding of teachers' experience of ICT usage in their daily teaching and learning activities. The observations made were recorded in the researcher's journal

for the purpose of triangulating findings. Data collection phase was followed by data analysis processes although the two processes are interrelated and cyclical.

4.7 DATA ANALYSIS

Data analysis is the process of organising data in order to come up with a conclusion (Glense, 2015). The type of analysis method is determined by the approach one has employed for their study. For example, with a quantitative approach, data analysis includes the calculation of frequencies of variables and differences between variables through the use of applications such as excel, micro-soft access, and SPSS (statistical package for social sciences) (Rubin and Babbie, 2016). However, with the Interpretivist paradigm approach, data analysis is carried out through the understanding or interpretation of data collected (Rubin and Babbie, 2016). Examples of data analysis in qualitative include: content analysis, narrative, disclosure, framework and grounded theory (Glense, 2015). Content analysis was used to analyse data collected through the use of semi-structured interviews, non-participatory observations and document analysis. Content analysis is the study of a talk which generally attempts to describe the phenomenon (Hebe, 2017).

For the purpose of this study data obtained was analysed in the following manner:

Table 4.1: Data analysis

Steps	**Description**
Step 1: studying	The researcher read all the notes from transcribed recordings of the interview, notes made from non-participatory observation and also from document analysis (separately) to gain an overview.
Step 2: Coding	Open coding: this process was carried out in order to initially identify and mark descriptive names for specific units in relation to the aims, objectives and research questions of this study.

	Axial coding: the codes were again evaluated so as to ensure that they are relevant to this study. Elective coding: final coding was performed and a final list was compiled.
Step 3: Final coding	The final coding list was then labeled following the conceptual framework and literature review to make it relevant to the study.

4.8 TRUSTWORTHINESS

According to Bertram and Christiansen (2014), the aim of ensuring trustworthiness in qualitative research is to ensure that the findings of that research are worth paying attention to. For this study, trustworthiness was ensured through credibility, transferability, dependability, and confirmability. Credibility was ensured through triangulation where data was collected through the use of different methods. These methods were non-participatory observations, document analysis, and semi-structured interviews. Transferability is the extent to which the findings of the study are applicable in other contexts (Bertram and Christiansen, 2014). It was ensured through sampling and description. Purposive sampling was used where teachers selected were those who were integrating EE themes. Descriptive details of those teachers and a thick description of how the study was carried out were provided.

Dependability is the extent to which a study could yield the same results when repeated (Best and Kahn, 2016). This was achieved by code recording and confirmability. Code recoding was also carried out where the same data was coded twice with an interval of a week and the two results are compared to see if they are still the same. To ensure confirmability the researcher kept documents containing information obtained during data collection so that he could reflect on them.

4.9 ETHICAL CONSIDERATIONS

According to Rubin and Babbie (2016), ethics has to do with what is right or wrong or what is acceptable or not acceptable and is a very important aspect in research especially in cases were humans and animals are part or subject of the study. Best and Kahn (2016) stated that it is very important for researchers to highlight ethical considerations in regard to their study. For this study, the following ethical standards were observed:

4.9.1 Ethical clearance

The researcher should request ethical clearance from the ethics committee to conduct a study on a particular research topic (Best and Kahn, 2016). The researcher obtained ethical clearance (ethical clearance number: 2018/05/16/07638876/MC) from the Department of Curriculum Development, College of Education at the University of South Africa (UNISA) (Appendix A). The researcher found it necessary to seek ethical clearance for this study so as to maximise potential benefits and minimise potential risks to participants. The researcher obtained permission to conduct the study at Thohoyandou from the Department of Education, Vhembe district (Appendix B). Permission was also obtained from the Vhembe district circuit manager (Appendix C) and principals of the sampled schools (Appendix D). Sampled participants were issued with an information sheet (Appendix D) providing all details regarding why, when and how the study would be carried out, what was expected of them, the possible risks and the benefits of the study. A consent form (Appendix E) was provided to participants to sign once they agreed to be part of the study.

4.9.2 Informed consent and voluntary participation

According to flick (2017), every participant involved in a study has to be informed of the nature of the study they are involved in and also have the right to choose if they want to participate in that particular study or not without being forced. In cases where the participants are minors or individuals who are mentally challenged, the researcher has to seek consent from legal guardians (Bertram and Christiansen, 2014). Should any participants have felt that they no longer wanted to be part of a study, the researcher would not have stopped them or penalized them (Flick, 2017).

For the purpose of this study, participants were teachers who are not minors, therefore, consent was sought from them directly. Before the researcher began with data collection, participants were issued with a consent form to sign. The consent form (Appendix D) clearly stated research details including when, how, and where the research would take place. Participants were informed of their right to withdrawal at any time without penalty or threat imposed on them should they feel it necessary to withdraw.

4.9.3 Protection from harm

It is the responsibility and the expectations of the participants that they are involved in a study that does not harm them in any way. Previously this principle was important in studies involving drugs or treatment that may be harmful to people (Flick, 2017) but it was recently discovered that research may also emotionally, physically or socially harmful and that this should be avoided at all costs (Bertram and Christiansen, 2014). For the purpose of the current study, non-vulnerable adult participants and non-sensitive information were involved. Therefore, the only foreseeable risk was an inconvenience as participants were non-vulnerable adults and non-threatening questions were asked.

4.9.4 Privacy

According to Litchtman (2013), every individual participating in a study expects their privacy to be ensured at all times since they may at times provide the researcher with personal information. In this study, all captured documents were encrypted to avoid easy access to information. Both electronic and hard copy data were kept by the researcher in a password-protected computer or in a locked cabinet or cupboard and he also handed the data to a supervisor at UNISA (where necessary) to keep in locked safe storage in the office and/or library.

4.9.5 Confidentiality and anonymity

It is both the participants' expectations and the responsibility of the researcher to ensure that no information that directly leads to the participant is revealed in written or

any other communication (Flick, 2017). This does not only imply to individuals but also to institutions that may be involved in a study. During publication, the researcher has the responsibility to protect the identities of individuals or institutions which can be achieved through the use of codes or changing the names of such institutions or individuals (Bertram and Christiansen, 2014). In this study, the researcher undertook not to reveal participants' names during data collection and publishing of the study. Instead, codes have been used to identify participants at all times.

4.10 POSSIBLE CONTRIBUTIONS OF THE STUDY

This study may lead to improvements in the integration of EE themes in the CAPS curriculum. This could be achieved since the study will identify certain factors that hinder the success of the integration of such themes. It may also inform policy developments made by the DBE and influence the introduction of EE as a subject on its own**.**

4.11 LIMITATION AND CHALLENGES OF THE STUDY

The size of the research sample has implications for the outcomes of the research investigation (Hebe, 2017). The sample size chosen for this study does not represent the entire population (Vhembe region) where EE themes are integrated into CAPS subjects, but the assumption is that if the same study would be carried out in a different place with the similar sample, similar results would emanate. However, for the purpose of limited generalization the researcher will collect data from five (n=5) different schools, from different teachers and also use more than one data collection instrument.

4.12 DISSEMINATION OF FINDINGS

The research findings of this study will be made available in the UNISA library. The researcher intends to publish articles from this study with a supervisor in accredited journals for the public to gain access to the contributed new knowledge. The Limpopo Department of Basic Education will be provided with a final hard copy. For participants who were involved in this study, the researcher will organise a feedback meeting where participants will be informed of the results.

4.13 CONCLUSION

This chapter outlined the research design and methodology applied for this study. Subheadings discussed include study research design, target population, and sampling method, instrument, data collection method, data analysis, ethical considerations, limitations of study and dissemination of findings.

CHAPTER 5
PRESENTATION OF EMPIRICAL DATA

5.1 INTRODUCTION

This chapter presents empirical data obtained from data collection. The first aspect of the empirical findings highlights the profile of each participant. These findings are presented and supported by participants' quotations in order to answer the research questions outlined in Chapter 1. The rest of the empirical findings are based on semi-structured interviews, non-participatory observations and document analysis which were carried out.

The study population comprised sampled teachers integrating EE themes in grade 10 subjects. A population is a group of elements, cases or individuals that conform to specified criteria and to which researchers intend to generalise the findings of the research (Rubin & Babbie, 2016). Convenient purposive sampling technique was used to select five (n=5) schools and ten (n=10) teachers as participants in this case study. Convenience purposive sampling involves the selection of elements or individuals that are available at that moment or at the place the researcher is interested in carrying out their study (Rubin and Babbie, 2016).

5.1 EMPIRICAL DATA

Empirical data is data that was obtained through reliable measurements or through observation (Rubin & Babbie, 2016). According to Rubin and Babbie (2016), empirical data is initiated through the development of assumptions of a certain subject under investigation. Research is then carried out to prove those assumptions through the collection of data. Empirical data can be either qualitative or quantitative. Qualitative data involves the investigation of human behaviour and quantitative data is aimed at quantifying data using a statistical method. For the purpose of the current study qualitative empirical data was employed. Data was collected through a face-to-face semi-structured interview, non-participatory observation, and document analysis.

5.3 PROFILING OF TEACHERS

Participants in this study were grade 10 secondary school teachers. The sample for this research study consisted of ten participants. Three of the teachers were males and seven were females. Teachers' working experience ranged from six to twenty-eight years. Two had been teaching for six years, two for nine years, one for fourteen years, one for seventeen years, one for nineteen years, one for twenty-three years and two for twenty-eight years. Teachers in this study included both single-grade (teaching one grade) and multi-grade (teaching more than one grade) teachers. Three teachers were teaching grades 10-12, three were teaching grades 9-11, two were teaching grades 1 and 12 and two were teaching grade 10 only. All had common grades which included grade 10 which was the focus of the study. All teachers integrated EE themes in grade 10 CAPS subjects.

Teachers in this study had qualifications ranging from the Secondary Teachers Diploma to Master of Education degree: two teachers had a Secondary teaching diploma, three teachers had the Bachelor of Education degree, one had a Postgraduate Certificate in Education two had Bachelor of Education Honours and two had Master of Education degrees. All teachers have been trained to teach the particular subjects they were teaching. Seven of the teachers are at CS1 (children specialist level one), two are HODs and one as deputy principal. However, none of the teachers had received training to integrate EE themes into their subjects.

5.4 TEACHER PROFILES

The identity of the participants is known only by the researcher. Hence, throughout this chapter, participants have been referred to as participant #1 to participant #10. The profile of every teacher participant as drawn from the face-to-face semi-structured interview information is illustrated in the subsequent paragraphs.

5.4.1 Teacher #1

Teacher #1 is a female. She is a secondary school teacher with 28 years of teaching experience. She has a Bachelor of Education (secondary). Teacher #1 is a CS1

teacher. She has only taught in one school. She has not received any training to integrate EE themes in her subjects. She teaches civil technology in grade 10 wherein she integrates EE themes. Teacher #1 also teaches civil technology in grades 11 and 12.

5.4.2 Teacher #2

Teacher #2 is female. She is a secondary school teacher who has 28 years of teaching experience. She has a Master of Education degree. She is a departmental head (DoH) in the current school. She has worked in four schools. She worked for seven years in the first school, six years in secondary school and two years in the third school and thirteen years in the current school. She has not received any training to integrate EE themes in her subjects. She teaches geography in grades 10 to 12 and English additional language in grade 10.

5.4.3 Teacher #3

Teacher #3 is female. She is a secondary school teacher who has six years of teaching experience in the same school. She is CS. She has a Bachelor of Education Honours (FET). She has not received any training to integrate EE themes in her subjects. Teacher #3 is a multi-grade teacher. She teaches economic management sciences in grade 9 and Economics in grade 10 and 11. She was trained to teach economics.

5.4.4 Teacher #4

Teacher #4 is female. She is a secondary school teacher who has 19 years of teaching experience in the same school. She is a departmental head. She has a degree in Bachelor of Education (FET). She has not received any training to integrate EE themes in her subjects. Teacher #4 is a multi-grade teacher. She teaches social science in grade 9, life sciences grade 10 and 12 and English in grade 12 wherein she integrates EE themes.

5.4.5 Teacher #5

Teacher #5 is female. She is a secondary school teacher who has 17 years of teaching experience in the same school. She is a departmental head teacher and has only taught in one school. She has a secondary teacher's diploma. She has not received any training to integrate EE themes in her subjects. Teacher #5 is a multi-grade teacher. She teaches physical science in grade 10 and 11 and natural science grade

5.4.6 Teacher #6

Teacher #6 is female. She is a CS1 secondary school teacher who has been working as a teacher for 9 years. She has worked in two schools. She worked for five years in the first school and four years in the current school. She has a Master of Education degree (guidance and counseling). She has not received any training to integrate EE themes in her subjects. She teaches life orientation in grades 10 to 12.

5.4.7 Teacher #7

Teacher #7 is a male. He is a CS1 secondary school teacher who has 14 years of teaching experience from two different schools. He taught for ten years in the first school and four years in the current school. Teacher #7 has a Bachelor of Education (FET) but has not received any training to integrate EE themes in his subjects. The only training that he received was when the CAPS were introduced, however, this was general training not focusing on specific themes of EE. Teacher #7 teaches English to grade 10 and 12 and economics grade 12 wherein he integrates EE themes according to the syllabus and relevant documents.

5.4.8 Teacher #8

Teacher #8 is a male who is a CS1 secondary school teacher with six years of teaching experience. He has taught in the current school only. Teacher #8 has a Bachelor of Commerce (Accounting) and a postgraduate certificate in Education senior phase. He has been trained to teach accounting. He has not received any training to integrate EE themes into his subject. Teacher #8 teaches accounting and

English grade 10.

5.4.9 Teacher #9

Teacher #9 is male. He is a Deputy Principal and secondary school teacher who has 23 years of teaching experience. Teacher #9 has only taught in one school. He has a secondary teaching diploma certificate and an Honours degree in law. Teacher #9 teaches history and geography. He has never been trained in the integration of EE themes in his subjects. He teaches history in grade 10 and geography grade 11 wherein he integrates EE themes. Teacher #9 is a multi-grade teacher teaching grades 10 through 12.

5.4.10 Teacher #10

Teacher #10 is a female. She is a CS1 secondary school teacher who has nine years of teaching experience. She has only taught in one school. She has a Master of Education degree. She has not received any training to integrate EE themes into her subjects. Teacher #10 teaches grade 10 agricultural sciences.

5.5 TEACHER PROFILE TABLE

Table 5.1: Teachers profile

Teacher participant	Gender and qualification	Work profile
Teacher #1	• Gender: Female. • Secondary school teacher • Qualifications: Secondary Teaching Diploma	• Experience: 28 years • Grade 10 subjects: civil technology • Other subjects: civil technology Grades: 11 and 12 • Position: CS1 • Training in the integration of EE themes: None
Teacher #2	• Gender: female. • secondary school teacher • Qualifications: Master of education	Experience: 28 years Grade 10 subjects: English and Geography Other subjects: Geography grades: 11 and 12 Position: CS1 Training in the integration of EE themes: None
Teacher #3	• Gender: female. • Secondary school teacher • Qualifications: Bachelor of education with Honours.	• Experience:6 years • Grade 10 subjects: Economics • Other subjects: economic management sciences grade 9 and economics grade 11 • Position: CS1 • Training in the integration of EE themes: none

Teacher #4	• Gender: female. • secondary school teacher • Qualifications: Bachelor of Education degree	• Experience: 19 years • Grade 10 subjects: Life sciences 10 • Other subjects: Social Sciences grade 9 and life sciences grade 11 • Position: HOD • Training in the integration of EE themes: None
Teacher #5	• Gender: Male. • Secondary schoolteacher • Qualifications: B.Ed. (Hons)	• Experience: 2 years • Grade 10 subjects: Physical Science Other subjects: physical science grade 11 and natural science grades 9, • Position: HOD • Training in the integration of EE themes: None
Teacher #6	• Gender: Male. • Secondary schoolteacher • Qualifications: B Ed	• Experience: 13 years • Grade 10 subjects: Life orientation, • Other subjects: life orientation rade11 and 12 • Position: CS1 • Training in the integration of EE themes: None

Teacher #7	• Gender: Male. • Secondary school teacher • Qualifications: B Ed	• Experience: 16 years • Grade 10 subjects: English grade 10 • Other subjects: English grade 12 and Economics grade 12 • Position: CS1 • Training in the integration of EE themes: None
Teacher #8	• Gender: Male. • Secondary school teacher • Qualifications: B.Com Accounting and Postgraduate Certificate in Education	• Experience: 6 years • Grade 10 subjects: Accounting and English • Position:CS1 Training in the integration of EE themes: None
Teacher #9	• Gender: Male. • Qualifications: Secondary teaching Diploma and Honours-degree in Law	• Experience: 23 years • Grade 10 subjects: History • Other subjects: Geography grade 12 • Position: Deputy principal • Training in the integration of EE themes: None

Teacher #10	• Gender: female. • Secondary schoolteacher • Qualifications: B Ed and Master in Education.	• Experience: 9 years • Grade 10 subjects: Agricultural Science • Position: CS1 • Training in the integration of EE themes: No

5.6 FACE-TO-FACE SEMI-STRUCTURED INTERVIEWS

When conducting the semi-structured interviews, the first question was based on methods and or approaches used in teaching and learning. The first question had five sub-questions. The questions were as follows (a) Please indicate the subjects and grade that you are teaching, (b) What teaching methods or approaches are you familiar with? (c) Are there any other teaching methods or approaches that you think are most suitable in teaching and learning? if yes, mention them. (d) There are theories that are commonly used in teaching and learning, how would describe the following teaching and learning theories in education: i) place-based, ii) social-constructivism, iii) outdoor experiential learning, and iv) connectivism and v) Which one do you apply when teaching? give reasons

The second question was based on the success and challenges that teachers are encountering when integrating EE themes. The second question had eight sub-questions. a) Do you have the relevant CAPS document for the subjects that you are allocated to teach? b) According to your knowledge, are EE themes supposed to be integrated into your CAPS subject? c) Are you able to integrate EE themes into your subject? Substantiate your answer. d) Are there any challenges you experience with

regard to the integration of environmental Education themes into your subject? If yes, mention those challenges. e) In most, the South African schools, overcrowding, and lack of resources are some of the hindrances of proper teaching and learning. f) what do you think could be the implications of overcrowding and lack of resources in integrating EE themes into your subjects? g) What do you think could be the implications of not teaching EE themes to learners? and h) In your view if all teachers in your school can integrate EE themes into their subjects, what would be the benefits: i) to the learners; ii) the school, and iii) the local environment?

The third question was based on strategies to enhance teacher's proficiency in integrating EE themes into their subjects. It had three sub-questions: a) According to your knowledge, is there any teacher who received training on how to integrate EE themes into CAPS subjects in this school? Elaborate your answer. b) Considering the benefits of integrating EE themes into CAPS subjects, what would you propose to the departmental head, deputy principal and or principal, regarding (i) lesson planning; ii) teaching methods or approaches; and iii) how to assess learners. c) Who are the other stakeholders that you think should be involved to enhance teachers' proficiency in integrating EE themes into their subjects? Support your answer. d) Is there any need for EE to be introduced as a CAPS subject? Give reasons.

5.6.1 Teacher's responses

The following are the teacher's responses to the above questions. Teacher's responses are discussed individually.

5.6.1.1 Methods and or approaches used in teaching and learning

Teacher #1

In response to the question, one teacher #1 indicated that she teaches civil technology in grades 10 to 12. Teacher #1 stated that she is familiar with both teacher-centered and learner-centered methods of teaching and learning. She gave examples of discussion, learner presentations, teacher presentations, and experiments. Concerning the appropriate method of teaching and learning, she

thinks that the teacher-centered teaching approach is the most suitable method of teaching and learning. When asked for describe theories that are commonly used in teaching and learning (PBL, SC, outdoor experiential and connectivism), she described PBL as a theory that focuses on a particular place where local issues are addressed. She described social constructivism as a theory that pays attention to learners socialising with others in a positive way and outdoor experiential learning as practical learning which involved learning through seeing and doing practical work. She described connectivism as the theory that makes it possible for teachers and other stakeholders to connect for the process of learning. When asked to indicate the theory that she applies when teaching, she said, "*I apply all these theories depending on the content of the day, and sometimes I am influenced by the lesson plan. For example, when doing practical work, I apply an outdoor experiential learning theory".*

Teacher #2

In response to question one which required the subjects and grade that the teacher is currently teaching, teacher #2 indicated that she is teaching English in grade 10 and geography in grades 10 to 12. Concerning the methods and or approaches used in teaching and learning, teacher #2 alluded to the discussion, presentation, demonstration and miming as teaching methods and considers all suitable for integrating EE themes in her subjects. However, she also thinks that a 'teacher-centered teaching approach' is the most suitable teaching and learning approach. When asked to describe theories that are commonly used in teaching and learning (PBL, SC, outdoor experiential and connectivism), she indicated that she was not familiar with PBL, SC, and connectivism. She described outdoor experiential as a theory that promotes learning that takes place outside the classroom. When asked to describe the theory that she applies when teaching she stated that:

> *"I cannot tell the one that I apply when teaching since I do not know what most of these theories are, however, in geography we have activities or learning themes that require us to be outside the class and in a particular environment, therefore I can conclude that I do apply outdoor experiential learning theory".*

Teacher #3

Teacher #3 indicated that she is teaching economics management sciences in grade 9 and Economics in grade 10 and 11 and is familiar with teacher-centered methods of teaching and learning. She regards the teacher-centered teaching approach as the most suitable method in teaching and learning for schools with a large number of learners in one class as it allows her to be in control.

In response to question one which queried methods and or approaches used in teaching and learning, teacher #3 gave the following answers: When asked for describe theories that are commonly used in teaching and learning (PBL, SC, outdoor experiential and connectivism) teacher #3 indicated her lack of familiarity with the terms. When asked which one she applies, she indicated that she does not know the theories, therefore, is not able to identify which one she applies and which she does not apply.

Teacher #4

In response to question one which queried the subjects and grade that the teacher is currently teaching, teacher #4 indicated that she is teaching social science in grade 9 and life science in grades 10 and 11. She is familiar with teacher-centered and learner-centered methods, and she thinks the latter is the most suitable since it gives learners the opportunity to be independent in their learning and to retain what they learned in class.

She gave the following description for theories that are commonly used in teaching and learning (PBL, SC, outdoor experiential and connectivism). She alluded that PBL

> "… *is a theory that targets the local community aimed to address issues that exist in that community for an example of drug abuse in a certain community. While social constructivism is a theory of learning through interacting with others. And outdoor experiential learning is learning outside the classroom, for example, a field trip. Connectivism was defined as digital learning, for example, learning*

through watching a television programme." Teacher #4 indicated that she applies SC.

Teacher #5

In response to question one which queried the subjects and grade that the teacher is currently teaching, teacher #5 indicated that she is teaching natural science in grade 9 and physical science in grades 10 and 11. Teacher #5 further indicated that she is familiar with teacher-centered learner-centered methods, which are question and answer method, discussion, and subject matter centered theory and the traditional way of teaching where the teacher delivers the lesson to learners. She thinks the teacher-centered teaching approach is the most suitable but the choice would depend on the content being covered, the resources available and time allocation. When describing theories that are commonly used in teaching and, she indicated PBL as a focus on a particular place where local issues are addressed. She described SC as a method of socialising with others in a positive way and outdoor experiential learning as practical learning which involves learning through seeing and doing practical work. She described connectivism as the approach where teachers and other stakeholders connect for the process of learning. Teacher #5 indicated that she applies experiential learning where learners learn through doing the practical part.

Teacher #6

In response to question one which queried the subjects and grade that the teacher is currently teaching, teacher #6 indicated that she is teaching life orientation in grades 10 to 12. Teacher #6 indicated that she is familiar with investigations, discussion, drama, presentation, demonstration, miming teaching methods and considers all of them suitable for integrating EE themes in her subjects. When asked which method she thinks is most suitable, she stated,

"*For me, all these methods are suitable depending on the topic that is being covered. When the topic we are tackling has too much information, I use the investigative learning method where I ask the learners to go and investigate then the following day I facilitate*

a discussion on their findings. When the topic we are tackling is very common, I adopt the learner-centered approach where I request the learners to discuss while I facilitate their discussion".

Teacher #6 described PBL as a type of teaching that requires a particular environment with its content based on that particular environment and what is happening around it. She described SC as a theory of interaction where there has to be a relationship and outdoor experiential learning as a method that involves more practical work and is learner-centered, meaning that it requires more effort from the learners and teachers as facilitators. She described connectivism as a theory that requires a connection between what is taught in the class and what is happening in the real world. She indicated that she applies out-door and place-based methods.

Teacher #7

Teacher #7 indicated that he is teaching English in grade 10 and 12 and economics in grade 12 and is he is familiar with both teacher-centered and learner-centered methods and thinks the most suitable method is the learner-centered where the focus is on the learners and the teacher is a facilitator, Teacher #7 gave the following description

of PBL:

"*Place-based learning, just as it says in the name, is a type of teaching and learning theory that is based in a particular place. The focus of the content or the themes is for a certain place and issues in that particular place.*"

He described SC as a theory of interaction where there has to be a correlation. Outdoor/experiential learning was described as a method that takes place outside the class. Connectivism was seen as a theory that requires a connection between what is taught in the class and what is happening in the real world. Teacher #7 indicated that he applies out-door and place-based methods.

Teacher #8

When asked of the grades and subjects he teaches, Teacher #8 indicated that he is teaching English and accounting in grade 10. In response to the question asking about teaching methods, teacher #8 indicated that he is familiar with teacher-centered and learner-centered methods which are interactive, collaborative and subject matter centered methods when teaching. He thinks of the teacher-centered approach as the most suitable in public schools such as his because of learner-centered approaches require resources that are lacking in public schools that are dependent on the department for almost all the resources. He described PBL as a type of teaching that requires a particular environment with its content based on that particular environment and what is happening around it. He described SC as a theory of interaction where there has to be a relationship and outdoor experiential learning as a method that involves more practical work and is learner-centered meaning that it requires more effort from the learners and teachers possibly as facilitators. He described connectivism as a theory that requires a connection between what is taught in the class and what is happening in the real world. Of the four theories, he stated that he applies when teaching he indicated that he applies out-door and place-based methods.

Teacher #9

In response to the question, one teacher #9 indicated that he teaches history in grade 10 and geography in grade 12. Teacher #9 indicated that he is familiar with both learner-centered and teacher-centered methods which are interactive. When asked which methods he thinks are most suitable, teacher #9 said he finds the teacher-centered method as the most suitable. He is a multi-grade teacher, teaching classes with many learners, therefore he is usually unable to apply learner-centred approaches such as discussions and presentations as it would take too much time and would make interfere with the syllabus schedule. In response to question 1, he described the four theories in teaching and learning, as follows: PBL as a type of teaching wherein the focus is in certain areas giving an example of tackling land pollution in a particular area where there is a high rate of land pollution; SC as a theory of how people relate or interact in ensuring environmental sustainability and outdoor experiential learning as a method that involves learning out of the usual

learning environment which is the classroom. He gave an example of a field trip or experiment on the school's local grounds. He described connectivism as a theory that requires a connection between real-life environmental issues and the theory taught in class which is delivered using different mediums. When asked which theory he applies when teaching, he indicated that he applies all of them.

Teacher #10

In response to the question, one teacher #10 indicated that she teaches agricultural sciences in grade 10. She further indicated that she is familiar with numerous learner and teacher-centered approaches. Teacher #10 applies learner-centered teaching methods. She indicated that the use of learner-centered approaches such as investigation and presentation which helps ensure that all learners understand the content. She further indicated that agricultural science is a practical subject that requires understanding, hence she applies learner-centered methods. When asked to describe theories that are commonly used in teaching and learning (PBL, SC, outdoor experiential and connectivism) she described PBL as a theory whose focus is on a particular place further stating that PBL theory addresses issues happening in a particular place of focus describing its events and finding solutions. She indicated that she had no clue of SC. Teacher #10 described outdoor experiential learning as a theory of learning through practical work and experiments and also stated that she was ignorant about connectivism. Teacher #10 further indicated that she applies experiential learning methods where learners learn through practical work since agricultural science is a practical subject.

5.6.1.2 The success and challenges that teachers are encountering when integrating EE themes

Teacher #1

In response to asking if the teacher has the relevant CAPS documents allocated, teacher #1 indicated that she had relevant CAPS documents. When asked if EE themes should be integrated into her subject, she indicated that EE themes are

supposed to be integrated into her subject and that she is able to integrate them. In response to the question asking about challenges she experiences when integrating EE in her subjects, she said the challenge of integrating EE themes in her subject is that learners do not want to get involved in the outside world and further indicated challenges such as overcrowding and lack of resources which retard the learning process. She gave an example:

> *"For example, some themes require a teacher to demonstrate to the learners, so if you don't have the necessary resources you have to explain instead and for some learners, it might be difficult for them to understand something they don't know and have never seen. In such cases you have to explain until the majority of the learners understand, consuming time which is already limited".*

When asked about the implications of not teaching EE, Teacher #1 stated that the implications of not teaching EE would be that learners are uninformed about issues around them and become indifferent adults. She indicated that if all teachers could integrate EE themes, learners would be empowered to tackle environmental problems such as environmental hygiene, which would improve their health, schools would be cleaner allowing the process of teaching and learning to progress and the local environment would be pollution-free.

Teacher #2

In response to asking if the teacher has the relevant CAPS documents allocated, teacher #2 indicated that she had relevant CAPS documents for her subject. In response to question 2, she indicated that EE themes are supposed to be integrated into her subjects (geography and English) and that she is able to integrate them. In response to the question about challenges with regard to implementing EE themes in her subject, she mentioned lack of finance as most themes required practical work but this could not be carried out because resources and money for necessary fieldwork were unavailable. When asked about the implications of a lack of resources, she mentioned that some themes cannot be taught at all. When asked what the implications of not teaching EE would be, she mentioned that those learners grow

up uninformed of issues around them. When asked about the benefits of the integration of EE themes by all teachers, she said that learners would be empowered to tackle environmental problems, the schools would be clean allowing the process of teaching and learning to progress and the local environment would also be clean.

Teacher #3

In response to the question of asking the teacher if she had relevant CAPS documents, teacher #3 stated that she had relevant CAPS documents. When asked if it was necessary for EE themes to be integrated into her subject, she indicated that she felt that EE themes should be integrated into her subject (economics) subjects and further stated that she is able to integrate them. In response to the question asking about challenges, Teacher #3 identified a lack of resources that would help in integrating EE in economics and gave books as an example. When asked about the implications of overcrowding and lack of resources, she mentioned that when the class is too big it becomes difficult to control as some learners grasp the opportunity to misbehave, which affects the teacher's performance and esteem. She further stated that the implication of lack of resources is that for some learners, learning aids are essential to understand the content so when there are none, the learning process becomes slow. In response to the implications of not teaching EE themes, she said it would result in natural resources exploitation as learners would lack the necessary knowledge to protect their resources. In response to the question asking what the benefits would be if all teachers would integrate EE in their subjects, she stated that learners would be helped with their career choices, as they would be able to identify gaps and scarce skills.

Teacher #4

In response to asking if the teacher has relevant CAPS documents allocated, teacher 4# stated that she had relevant CAPS documents. She indicated that EE themes are supposed to be integrated into her subjects and that she is able to integrate them as learners are aware of the environment. In response to the question asking about the

challenges she faces when integrating EE themes in her subjects, she said she did not face any challenges.

With regard to the implications of overcrowding and lack of resources, she said: "W*hen the class is too big, it becomes difficult to control it as some learners would see it as an opportunity to misbehave, which then affects the teachers' performance and esteem because as a teacher you feel the need for the learners to respect you and focus when you are teaching*".

When asked about the implications of overcrowding and lack of resources she stated that for some learners, learning aids are essential to understand the content so when they are lacking, the learning process is retarded. When asked what the implications of not teaching EE would be, she also indicated that not teaching EE would result in natural resources exploitation as learners would lack the necessary knowledge to protect their resources. In response to the question asking what the benefits would be if all teachers would integrate EE in their subjects, she stated that it would help learners with their career choices, as they would understand the environment better, the relationship between human beings and the environment and the gaps in taking care of the environment.

Teacher #5

In response to asking if the teacher has relevant CAPS documents allocated, the teacher indicated that she had relevant CAPS documents. She stated that EE themes are supposed to be integrated into economics subjects and that she is able to integrate them. In response to the question asking about challenges she faces when integrating EE themes in her subjects, the teacher mentioned the lack of resources that

would help in teaching EE in economics. When asked about the implications of overcrowding, she stated that when the class is too big it becomes difficult to move around. Thus, the teacher cannot focus on a certain individual, which makes learning difficult as she cannot ensure that all learners understand the content before moving to the next topic. She further indicated that the implication of a lack of resources is that some themes require specific resources and without those

resources, such themes have to be skipped. When asked of the implications of not teaching EE, she mentioned that it would result in the learners and the entire community's underestimation of how dependent we are on the environment as human beings, leading to negligence and mistreatment of the environment. When asked what the benefits are if all teachers could integrate EE themes, she said that it could help learners with their career choices, the school would attract more funders and the local environment would be kept clean and disease-free.

Teacher #6

In response to asking if the teacher has relevant CAPS documents allocated, the teacher indicated that she had relevant CAPS documents. She stated that EE themes are supposed to be integrated into life orientation subjects and that she is able to integrate them. In response to the question asking about challenges, she faces when integrating EE themes in her subjects she mentioned insufficient textbooks for teaching EE, overcrowded classes and periods which are too short to cover the expected content. In response to the question asking about the implications of overcrowding and lack of resources, the teacher stated the implications of overcrowding: when the class is too big, it becomes difficult to move around and does not allow the teacher to focus on a certain individual, which makes learning difficult as the teacher cannot make sure that all learners understand the content before moving to the next topic. The lack of resources means that learners cannot be independent as they depend on the teacher for knowledge. Teacher #6 further indicated that the implication of overcrowding is that it might be impossible to make sure that everyone fully understands what you are saying. When asked about the implication of not teaching EE, she said that not teaching EE in schools is not a problem since there are other sources of EE such as books and the media which are also influential. In response to the question asking what the benefits would be if all teachers would integrate EE in their subjects, she indicated that learners would become environmentally conscious, the school would benefit accordingly and learners would keep the school premises and their local environment clean.

Teacher #7

In response to asking if the teacher has relevant CAPS documents allocated, Teacher

#7 indicated that he had relevant CAPS documents. In response to the question asking if EE themes are supposed to be integrated into his subjects, teacher #7 said they are supposed to be integrated into the subjects and he is able to integrate them. In response to the question asking about the challenges he faces when integrating EE themes in his subjects, the teacher indicated that he does not face any challenges when integrating EE themes in his subject.

With regard to the implications of overcrowding, he indicated that when the class is too big, it becomes difficult to control and monitor the understanding and progress of the learners and with a lack of resources, learners cannot be independent as they rely on the teacher for knowledge. Overcrowding in classes also makes it difficult to ascertain if everyone fully understands what you are saying.

When asked of the implications of not teaching EE themes, teacher #7 stated that teaching EE is a priority since without the environment we would not survive, therefore people should be educated on how they depend on the environment and the implications of their actions on the environment. In response to the question asking what the benefits would be if all teachers would integrate EE in their subjects, he explained that it could help learners to be environmentally literate and friendly, the school would benefit since the learners would be environmentally friendly and they keep the school premises and their local environment clean.

Teacher #8

In response to asking if the teacher has relevant CAPS documents allocated, Teacher #8 indicated that he has relevant CAPS document. In response to the question asking if EE is supposed to be integrated into his subject, he indicated that there was a need to integrate EE themes in his subjects and that he is able to integrate them. In response to the question asking about challenges he faces when integrating EE themes in his subjects, the teacher indicated that there are many challenges but the main challenges of integrating EE themes in his subject were lack resources, overcrowded classes and short periods. With regard to the implications of the challenge of overcrowding, he stated that some learners needed his attention more than others in order for them to understand, but when the class is overcrowded it is difficult to give due attention to the latter. The implications of lack of resources are

that some lessons cannot be carried out as planned, for example, experiments cannot be carried out without the necessary. Teacher #8 also indicated that overcrowding has the same impact; it increases the demand for resources that are already inadequate. In response to the question asking what the implications of not teaching EE would be, teacher #8 also indicated this is a problem since school is one of the very few places where relevant and necessary education is handed out. He implied that if schools or the department does not play its part, the environment will suffer from misuse by human beings. In response to the question asking what the benefits would be if all teachers would integrate EE in their subjects, he said that it could help learners to be environmentally conscious and would extend career choices, the school would benefit since the learners would be environmentally conscious and keep the school premises and their local environment clean.

Teacher #9

In response to asking if the teacher has relevant CAPS documents allocated, teacher #9 indicated that she had relevant CAPS documents. When asked if EE themes are supposed to be integrated into her subject, she stated that she is able to integrate EE themes. In response to the question asking about challenges, she faces when integrating EE themes in subjects, she indicated a lack of resources which is exacerbated in big classes as it becomes difficult to move around and does not allow the teacher to focus on a certain individual to determine if he or she has understood the content before moving to the next topic. Further, learners cannot be independent as they rely on the teacher for knowledge. When asked of the implications of not teaching EE themes to learners, teacher #9 said that there would be no implications if EE is not taught since there are other sources of EE such as books and the media which are also influential. In response to the question asking what the benefits would be if all teachers would integrate EE in their subjects, he said that it could help learners be environmentally conscious and promote their career choices, the school would benefit since the learners would be environmentally conscious and keep the school premises and their local environment clean.

Teacher #10

When asked if she has relevant CAPS documents, the teacher indicated that she does. In response to the questions asking, if EE themes are supposed to be integrated into her subject which is agricultural science, she agreed and indicated she is able to integrate EE themes. In response to the question asking about challenges when integrating EE themes in her subjects she mentioned that since agriculture is practical and more focused on the environment, it requires a lot of equipment and field trips or experiential work which is a challenge since the department is still struggling to provide enough resources. When asked about the implications of overcrowding and lack of resources in integrating EE themes, the teacher stated overcrowding and lack of resources hinder the learning process. When asked what the implications of teaching EE, teacher #10 indicated that EE empowers learners with environmental knowledge which creates a relationship between them and the environment, allowing learners to make informed decisions related to the use of the environment. Therefore, not teaching EE would lead to environmentally illiterate communities wherein the environment is habitually destroyed. When asked what the benefits if all teachers could integrate EE themes, she said that it could help learners be environmentally conscious and promote career choices, the school would benefit since the learners would be environmentally conscious and keep the school premises and their local environment clean.

5.6.1.3 Strategies to enhance teacher's proficiency in integrating EE themes into their subjects

Teacher #1

In response to whether there is a need for teachers to receive training to integrate EE themes in their subjects, teacher #3 indicated that there is a need for teachers to receive training to integrate EE themes because they face many challenges that could be addressed through the training. When asked what the teacher would propose to the head of department, deputy principal and or principal, regarding lesson planning, teaching methods or approaches, and how to assess learners, Teacher #1 said teachers must plan their lessons on time because they lack resources which requires

them to be smart enough to cover all themes even without relevant resources. With regard to teaching and learning methods, she said teachers should adopt learner-centered approaches since they allow learners to explore as much as possible. She also indicated that learner assessment should be done regularly to identify if learners understand EE themes taught.

When asked of other stakeholders who should be involved to enhance teachers' proficiency in integrating EE themes into their subjects Teacher 1 stated that stakeholders should include local headmen in order to facilitate permission to use relevant pieces of land in the communities for activities such as experiments and the Department of Environmental affairs. When asked if there was a need for EE to be introduced as a CAPS subjects, she agreed and stated that we interact with the environment on a daily basis and depend on it for food and other needs, therefore, making it a CAPS subject will allow us to explore as much as we can about the environment.

Teacher #2

When asked of the need for teachers to receive training on integrating EE themes, Teacher #2 indicated that there is a need for teachers to receive training to integrate EE themes, however, the training should not be for a long duration because teachers have enough environmental knowledge acquired through television and radio programmes. When asked what the teacher would propose to the head of department, deputy principal and or principal regarding lesson planning, teaching methods or approaches, and how to assess learners, she said that she had no recommendations on the integration of EE themes regarding lesson planning, teaching and learning methods and assessment of learners. When asked if other stakeholders can be involved to enhance teachers' proficiency in integrating EE themes in their subjects, she indicated the Department of Environmental affairs. She further explained that the Department of Education is struggling to provide enough funding to support the enhancement of EE themes integration. However, the Department of Environment deals directly with the environment and as such, they would priorities EE and provide schools with enough relevant resources. In response to the question asking if there is a need for EE to be introduced as a

subject, Teachers #2 indicated no need for an additional subject as there was already too much work and learners struggled to cope.

Teacher #3

With regard to the need for teacher training, teacher #3 indicated that there is a need for teachers to receive training to integrate EE themes. When asked what the teacher would propose to the head of department, deputy principal and/or principal, regarding lesson planning, teaching methods or approaches, and how to assess learners, Teacher #3 said that EE should be prioritised during lesson planning like any other themes. During lesson planning, all required resources must be outlined and gathered in order for lessons to run smoothly and effectively. With regard to teaching and learning methods, teachers should utilise methods that promote learning and encourage learners to take control of their learning as this allows them to retain what they learn in classes. She also said learners should be assessed on every EE theme tackled. Assessment should be different depending on the theme covered.

When asked which other stakeholders could be involved, she mentioned the Department of Environmental Affairs as the staff is more knowledgeable about the environment. In response to whether EE should be introduced as a subject she agreed and stated that EE is broad and introducing it as a subject would allow for its full exploration because integration in other subjects limits its content.

Teacher #4

When asked if there is a need for teachers to receive training to integrate EE themes, teacher #4 stated that there is a need because it is difficult for them to integrate it in some subjects. When asked what the teacher would propose to the head of department, deputy principal and/or principal, regarding lesson planning, teaching methods or approaches, and how to assess learners, the teacher said that with regards to lesson planning, no lesson must be carried out without lesson plans and the HOD and principals must ensure that all lessons are carried out through regular assessment of learner performance. With regard to teaching and learning methods, she stated that resource shortage and other challenges that affect the integration of EE should be addressed to avoid limiting the use of a variety of teaching methods

because different themes may require certain methods. With regard to the assessment of learners, she felt learners should not only do written assessments in EE but also by other means. Thus, learners will be aware of the importance of the environment.

With regard to other stakeholders who could be involved to enhance teachers' proficiency in integrating EE themes, she indicated local community members. She explained that if children are made environmentally conscious and the rest of the community is excluded, the main goal of EE, environmental sustainability, will be defeated. It is difficult for learners to convince the rest of their families who are uninformed about the need for sustainability. When asked if there was a need for EE to be introduced as a CAPS subjects, she agreed and stated that there is a lot about the environment that has to be taught and applying it in different subjects does not cover all aspect of the environment She further indicated that the subject should be made compulsory to all learners.

Teacher #5

When asked if there is a need for teachers to receive training to integrate EE themes, teacher #5 agreed there is a need for teachers to be trained. When asked what the teacher would propose to the head of the department, deputy principal and/or principal regarding lesson planning, teaching methods or approaches, and how to assess learners, Teacher #5 said in subjects where lesson plans are not provided, teachers should work in groups during school holidays to assist each other with lesson plans. With regard to teaching and learning methods, she stated that when deciding on teaching methods, teachers should consider the size of the class, the length of the period and available resources. Learners should also be assessed regularly.

In response to the question asking which stakeholders could be involved, teacher #5 said that no other stakeholders should be involved to enhance the teacher's proficiency in integrating EE themes in subjects. When asked if there was a need for EE to be introduced as a CAPS subjects, she agreed and stated that EE is broad and introducing it as a subject would allow for it to be explored in depth. This would

also influence learner behaviour towards the environment more positively.

Teacher #6

With regard to the need for teachers to receive training to integrate EE themes teacher #6 stated:

> "*Thorough training is needed, most teachers from my school starting working during the time of the curriculum 2005, and the curriculum has changed twice without us receiving any training which can be confusing. If we get to be trained, even on the integration of EE we won't pass our confusion to learners"*.

When asked what the teacher would propose to the head of department, deputy principal and/or principal, regarding lesson planning, teaching methods or approaches and how to assess learners, Teacher #6 said that she had no recommendations to the HODs and principals in terms of the lesson plan, teaching and learning methods and assessment of learners.

In response to other stakeholders who could be involved, Teacher #6 stated that she felt that the Department of Environmental Affairs should be involved. When asked if there was a need for EE to be introduced as a CAPS subjects, she agreed and stated that it would decrease the burden faced by teachers in subjects where there is too much work to do.

Teacher #7

When asked if there is a need for teachers to receive training to integrate EE themes in their subjects, Teacher #7 indicated that there is a need for teachers to receive training to integrate EE themes because training empowers teachers and gives them confidence in the integration of EE themes. When asked what the teacher would propose to the HoD, deputy principal and/or principal, regarding lesson planning, teaching methods or approaches, and how to assess learners Teacher #7 said teachers must submit lesson plans early to HoDs to ensure integration of all themes. With regard to teaching and learning methods, he said teachers should adopt learner-centered approaches since they allow learners to explore as much as

possible. With regards to the assessment of learners, he said the assessment should be planned beforehand and carried out without fail for every theme covered.

When asked of other stakeholders who should be involved, Teacher #7 stated that local leaders and NGOs should be involved. When asked if there was a need for EE to be introduced as a CAPS subjects, she agreed and stated that we interact with the environment on a daily basis and depend on it for food and other needs, therefore, making it a CAPS subject will allow us to explore as much as we can about the environment.

Teacher #8

When asked if there was a need for teachers to be trained to integrate themes in their subjects, teacher #8 said there is a need for teachers to be trained since the syllabus changes and some teachers may find it difficult to adapt to changes. When asked what the teacher would propose to the head of department, deputy principal and/or principal, regarding lesson planning, teaching methods or approaches, and how to assess learners, Teacher #8 recommended that lesson plans should be finalised before the beginning of every school term. With regard to teaching and learning methods, teachers should adopt the learner-centered method as it allows learners to acquire as much knowledge as possible and learners should be assessed on a daily basis.

When asked about other stakeholders who should be involved to enhance teachers' proficiency in integrating EE themes into subjects, teacher #8 indicated student environmentalists from the local university. They should be invited to come and assist teachers, especially during practical workdays. When asked if there was a need for EE to be introduced as a CAPS subjects, he said there was still a gap in the integration of EE themes, therefore, introducing an EE subject would compensate for this gap.

Teacher #9

When asked of the need for teachers to receive training to integrate EE themes in their subjects, Teacher #9 stated that there is a need so that teachers can be empowered

to deal with challenges of overcrowding and lack of resources. When asked what the teacher would propose to the head of department, deputy principal and/or principal, regarding lesson planning, teaching methods or approaches, and how to assess learners Teacher #9 stated that with regard to lesson planning, lesson plans must be compulsory. He stated that resource shortage and other challenges that affect the integration of EE should be addressed to avoid limiting the use of a variety of methods because different themes may require certain methods to ensure understanding. Finally, different methods of learner assessment should be used, for example, classwork, test, and oral exam.

When asked of other stakeholders who should be involved, Teacher #9 did not identify any other stakeholders who should be involved to enhance teachers' proficiency in integrating EE themes into subjects in mind. In response to whether EE should be introduced as a subject on its own, teacher #9 said there was a need for EE to be introduced as a CAPS subject because EE is still undermined. Teachers may feel that people interact with the environment every day and due to that they might not integrate EE themes accordingly but if there is a subject that focuses on EE, a wealth of content will be covered which will stress its importance to the learners.

Teacher #10

In response to whether there is a need for teachers to receive training, teacher #10 indicated a need for teachers to receive training to integrate EE themes in order to ensure consistency in all schools and to ensure that there is no school that is not integrating EE themes. When asked for recommendations to HODs and principals with regards to lesson planning, teaching and learning methods and assessment of learners, Teacher #10 indicated that he had no recommendations since according to his knowledge the management was doing all they can to promote EE in his school. The dominating issues were lack of resources and overcrowding in classes.

When asked about other stakeholders who should be involved to enhance teachers' proficiency in integrating EE themes into subjects, she indicated the local headmen, who influenced the communities. Therefore, involving them in EE would attract sponsors who would help to address the lack of resources. When asked if there was a need for EE to be introduced as a CAPS subject, she disagreed and stated that the

department is already struggling to support current subjects and the addition would increase the demand for scarce resources.

5.7 NON-PARTICIPATORY OBSERVATIONS

Non-participatory observation is a technique of data collection where the researcher observes the participants while they teaching (with them being aware that they are being observed) but without being involved in the situation (Best and Kahn, 2016). For the purpose of the current study, the researcher visited the sampled schools and observed teachers as they were teaching. The observation aimed at observing how teachers integrate EE themes in their subjects. An observation schedule was used the researcher arranged with the teachers to visit them during lessons so as to observe them on duty. Factors observed were lesson planning, presentation, learner involvement, and assessment activity. Teachers were observed individually and the findings are presented in the ensuing sections.

Teacher #1

Teacher#1 from school A presented a civil technology lesson in a grade 10 class under the theme ‘Civil services’ covering the topic of sewerage systems. Before the lesson, the teacher presented the researcher with a lesson plan outlining how the lesson was to take place to which the teacher adhered during the lesson. The lesson plan design included the topic, introduction, presentation of the new subject content, assessment activity, and conclusion. During the lesson, the approach used was a ‘learner-centered approach’. The choice of the teaching approach allowed the teacher to engage the learners in the discussion as she gave an introduction that was detailed enough to encourage learner participation. During the discussion, learners were also able to ask questions for clarification which she answered. The teaching resources used were charts with both text and graphics. With regard to the design assessment activity (classwork), the teacher paid attention to low order questioning and eliminated the middle and high order questioning. The assessment given was individual-based. Questions did not promote learners’ problem-solving skills but focused on defining terms. Due to time, the teacher was not able to give feedback to the learners.

Teacher #2

Teacher #2 from school B presented a geography lesson in a grade 10 class under the topic ‘Greenhouse effect on people and the environment’. Prior to the lesson presentation, teacher#3 gave me the lesson plan. The lesson plan design included the topic, introduction, presentation of the new subject content, assessment activity, and conclusion. During the lesson presentation, the teaching approach used was teacher-centered rather than learner-centered. As a result, during the introduction, the teacher did not engage learners through the use of the questioning method in order to actualize their prior knowledge; therefore, learners’ participation during the lesson presentation was minimal. In her presentation of the new subject content, the focus was on writing down facts on the board, other than engaging learners and establishing the atmosphere of learning. There were no teaching resources used in order to clarify certain concepts related to the greenhouse effect on people and the environment. Despite the fact that several learners had questions to ask, very few with their hands raised to seek clarity were given the opportunity to ask questions. Instead of involving other learners to answer the questions, the teacher was the center of everything. With regard to the design assessment activity (classwork), the teacher paid attention to low order questioning and eliminated the middle and the high order questioning. The assessment given was a group assessment. Questions did not promote learners’ problem-solving skills but focused on defining terms. The teacher did not give learners feedback. Although the conclusion was indicated in the lesson plan, the teacher focused on giving corrections on the board and forgot to conclude the lesson.

Teacher #3

Teacher #3 from school C presented an economics lesson in grade 10 class under the theme ‘Natural resources’. Her lesson was under the topic of minerals and energy. Prior to the lesson, she presented the researcher with a lesson plan outlining the topic, introduction, presentation of the new subject content, assessment activity, and conclusion. The lesson was carried out through a learner-centered approach which was teacher presentation. Her presentation was in the form of a PowerPoint and was informative as it included pictures. During the introduction, she did not

manage to get the learners involved. However, learners showed interest in her presentation and were given the opportunity to talk during the lesson although the choice of the approach did not allow for maximum participation from the learners. During the discussion, learners asked questions for clarification and the teacher gave the learners the opportunity to answer the questions and clarified them further where necessary. The assessment took place in the form of debate, however, time was limited so learners could not exhaust all their ideas and the debate raised more questions which the learners answered. The teacher also gave verbal feedback to the learners.

Teacher #4

Teacher #4 from school A presented a life sciences lesson in grade 10 class under the topic 'The environment's effect on people and the environment'. Prior to the lesson presentation, teacher#4 gave the researcher the lesson plan. The lesson plan design included the topic, introduction, presentation of the new subject content, assessment activity, and conclusion. During the lesson presentation, the teaching approach used was teacher-centered rather than learner-centered. However, the teacher managed to involve learners beginning with the introduction by asking prior knowledge and also during the lesson by asking questions. In her presentation of the new subject content, the focus was on providing learners with study notes by writing on the board but the teacher continued to involve them through asking questions. Learners were not given the opportunity to initiate questions. There were no teaching resources used in order to clarify certain concepts. Instead of involving other learners to answer the questions, the teacher was the center of everything. With regard to the design assessment activity (classwork), the teacher paid attention to both low order questioning, the middle order, and the high order questioning. The assessment given was an individual task. Questions promoted learners' problem-solving skills. Feedback was given through giving corrections on the board and the teacher forgot to conclude the lesson.

Teacher #5

Teacher #5 from school D presented an accounting lesson in the grade 10 class under the topic 'Management of resources'. Prior to the lesson presentation, teacher#5

provided the lesson plan. The lesson plan design included the topic, introduction, presentation of the new subject content, assessment activity, and conclusion. During the lesson presentation, the teaching approach used was ‘question and answer’. However, the teacher did not give an introduction at the beginning of the lesson as stated in the lesson plan. The teacher only announced the topic of the day and started asking learners questions. The approach chosen allowed the learners to be involved in the lesson. During the lesson, the teacher asked learners a question and when their answers were correct, he acknowledged them which gave them even more confidence to participate in the lesson. When the answers were incorrect or needed more clarity, the teacher assisted. There were no teaching resources used throughout the lesson. An individual assessment was given in the form of classwork which was later corrected and the

teacher gave verbal feedback highlighting areas where learners had to do more research for better understanding. Questions promoted learners' problem-solving skills. No conclusion was given.

Teacher #6

Teacher #6 from school A presented a life orientation lesson in grade 10 class under the topic 'Social and environmental justice'. Prior to the lesson presentation, teacher#6 gave me the lesson plan. The lesson plan design included the topic, introduction, presentation of the new subject content, assessment activity, and conclusion. During the lesson presentation, the teaching approach used was 'debate'. The teacher gave an introduction explaining the content of the day and instructions on how the debate was to be carried out. The choice of the approach gave learners control to learning. Learners were not given the opportunity to ask questions. There were no teaching resources used in order to clarify certain concepts. With regard to the design assessment activity (classwork), the teacher paid attention to both low order questioning, the middle order, and the high order questioning. The assessment was given as an individual task. Questions promoted learners' problem-solving skills. Feedback was given through writing corrections on the board. A conclusion was given at the end of the lesson.

Teacher #7

Teacher #7 from school E presented an English lesson in grade 10 class under the topic 'Endangered species'. Prior to the lesson presentation, teacher#7 gave the researcher the lesson plan. The lesson plan design included the topic, introduction, presentation of the new subject content, assessment activity, and conclusion. During the lesson presentation, the teaching approach used was learner-centered comprising discussion. The teacher involved learners from the beginning of the introduction and during the lesson by asking them questions that probed prior knowledge and engaged them in the lesson. In his presentation of the new subject content, the focus was on promoting learners' understanding of the content through encouraging classroom discussion and asking questions for clarification. The teacher made learners the center of the lesson by giving them the opportunity to answer questions asked by other learners. There were no teaching resources used in order to clarify certain concepts. Due to time, the individual assessment (classwork) was

cut short and corrections were given. No conclusion was given.

Teacher #8

Teacher #8 from school E presented a physical science lesson in grade 10 class under the topic ‘The hydrosphere’. The prior lesson to the presentation, teacher#8 gave the researcher the lesson plan. The lesson plan design included the topic, introduction, presentation of the new subject content, assessment activity, and conclusion. During the lesson presentation, the teaching approach used was teacher-centered rather than learner-centered. The teacher did not manage to get learners involved during the introduction by activating prior knowledge, however, during the lesson he engaged them by asking them questions. The presentation involved the sharing of important notes by writing on the board. Learners were not given the opportunity to ask questions. The teaching resources used were charts and pictures. A group assessment was given in the form of an assignment but the feedback was not given. Questions promoted learners’ problem- solving skills. A conclusion was given at the end of the lesson.

Teacher #9

Teacher # from school A presented a history lesson in grade 10 class under the topic ‘The effects of the black death (pollution)’. The prior lesson to the presentation, teacher#9 gave the researcher the lesson plan. The lesson plan design included the topic, introduction, presentation of the new subject content, assessment activity, and conclusion. During the lesson presentation, the teaching approach used was more teacher-centered than learner-centered. However, the teacher managed to involve learners during the introduction by activating prior knowledge and during the lesson by asking learners questions. In his presentation of the new subject content, the focus was on providing learners with study notes by writing on the board while continuing to ask learners questions. Learners were not given the opportunity to ask questions. There were no teaching resources used in order to clarify certain concepts. Instead of involving other learners to answer the questions, the teacher was the center of everything. With regard to the design assessment activity (classwork), the teacher paid attention to both low order questioning, the middle order, and the high order questioning. The assessment given was an individual task. Questions promoted

learners' problem-solving skills. Feedback was given by giving corrections on the board; no conclusion was given.

Teacher #10

Teacher #10 from school A presented an agricultural sciences lesson in grade 10 class under the topic 'Sustainable resources utilization'. Before the lesson, the teacher presented a lesson plan to the researcher highlighting the topic, introduction, presentation of the new subject content, assessment activity, and conclusion of the lesson of the day. During the lesson presentation, the teaching approach used was more teacher-centered than learner-centered. The teacher involved the learners from the introduction to the end of the lesson by asking them questions and giving them the opportunity to answer questions from other learners who needed clarity. In her presentation of the new subject content, the focus was on demonstrating to the learners to get them to understand. Learners were not given the opportunity to ask questions. No teaching resources were used in order to clarify concepts. Instead of involving other learners to answer the questions, the teacher was the center of all activities. With regard to the design assessment activity (classwork), the teacher paid attention to low order questioning, the middle order and the high order questioning. The assessment given was an individual task. Questions promoted learners' problem-solving skills. Feedback was given by giving corrections on the board; no conclusion was given.

5.8 DOCUMENT ANALYSIS

Viswambharan and Priya (2016) state that document analysis involves the interpretation of documents by the researcher to give voice and meaning around the problem being investigated. For the purpose of this study, the researcher went through documents with information related to the integration of EE themes in other CAPS subjects. A rubric was used to review documents. The following documents were analysed: CAPS subjects' policy documents, pace-setters, Lesson Plans, and assessment activities. Pace-setter is a document that shows the sequence that the teacher should follow in covering the context in the teaching plan (DoE, 2019). A Lesson Plan is a document that gives a detailed description of the course of instruction or learning for lessons for each particular subject that is prepared before lessons take place (DoE, 2019). The assessment document shows a list of all

assessments to be carried out for each theme or chapter of the textbook. Findings are discussed below and presented in tables for each teacher:

When the researcher visited schools for data collection, all ten teachers had CAPS policy documents, two teachers did not have Pacesetters (teacher #5 and teacher #7), all teachers had lesson plans and three teachers did not have learner assessment documents available (teacher#2, #4 and #10).

Teacher #1

Subject: Civil technology

Grade: 10

Table 5.2: Document analysis teachers #1

	CAPS Policy document	Pace-setters	Lesson plan /preparation	Assessment
1. List environmental themes	✓	✓	✓	✓
2. Integration to EE	✓	✓	✓	✓
3. Importance and link of themes to EE	✓	✓	✓	✓

Teacher #1 had four documents (CAPS Policy document, Pacesetters, lesson plan/preparation, and assessment) and documents for civil technology grade 10 when the researcher visited the school for data collection. CAPS Policy document, Pacesetters, Lesson plan /preparation documents and assessment documents all had a list of EE themes. All four documents that were available showed that they all complied with the integration of EE themes since they all had EE themes. All four documents showed the importance of EE and the themes that were linked to EE were as follows:

- Civil services water supply
- Civil services storm water

- Civil services sewerage

Teacher #2

Subject: Geography

Grade: 10

Table 5.3: Document analysis teachers #2

	CAPS Policy document	Pace-setters	Lesson plan /preparation	Assessment
1. List environmental themes	✓	✓	✓	-
2. Integration to EE	✓	✓	✓	-
3. Importance and link of themes to EE	✓	✓	✓	-

Teacher #2 had three out of the four documents (CAPS Policy document, Pacesetters and lesson plan/preparation) documents for geography grade 10 when the researcher visited the school for data collection. She did not have assessment documents. CAPS Policy document, Pace-setters and Lesson plan /preparation documents all had a list of EE themes. All three documents that were available showed that they all complied with the integration of EE themes. All three available documents showed the importance of EE and the themes that were linked to EE were as follows:

- The ozone layer
- Greenhouse effect on people and the environment
- Moisture in the atmosphere
- Earthquakes
- Population growth
- Water management
- Floods

Teacher #3

Subject: Economics

Grade: 10

Table 5.4: Document analysis teachers #3

	CAPS Policy document	Pace-setters	Lesson plan /preparation	Assessment
1. List environmental themes	✓	✓	✓	✓
2. Integration to EE	✓	✓	✓	✓
3. Importance and link of themes to EE	✓	✓	✓	✓

Teacher #6 had four documents (CAPS Policy document, Pacesetters, lesson plan/preparation, and assessment) documents for economics grade 10 when the researcher visited the school for data collection. CAPS Policy document, Pace-setters, Lesson plan /preparation documents and assessment documents all had a list of EE themes. All four documents that were available showed that they all complied with the integration of EE themes. All four documents showed the importance of EE and the themes that were linked to EE were as follows:

- Natural resources: Land
  - ✓ Minerals and energy
  - ✓ Fishing
  - ✓ Forestry

Teacher #4

Subject: Life science

Grade: 10

Table 5.5: Document analysis teachers #4

	CAPS Policy document	Pacesetters	Lesson plan /preparation	Assessment
1. List environmental themes	✓	✓	✓	-
2. Integration to EE	✓	✓	✓	-
3. Importance and link of themes to EE	✓	✓	✓	-

Teacher #4 had three out of the four documents (CAPS Policy document, pacesetters and lesson plan/preparation) documents for life science grade 10 when the researcher visited the school for data collection. She did not have assessment documents. CAPS Policy document, Pacesetters and Lesson plan /preparation documents all had a list of EE themes. All three documents that were available showed that they all complied with the integration of EE themes. All three available documents showed the importance of EE and the themes that were linked to EE were as follows:

- Biosphere to ecosystem
  - ✓ Biosphere
  - ✓ Biome
  - ✓ Environment
  - ✓ Ecosystem
- Biodiversity and classification
- History of life on earth

Teacher #5

Subject: Physical science

Grade: 10

Table 5.6: Document analysis teachers #5

	CAPS Policy document	Pace setters	Lesson plan /preparation	Assessment
1. List environmental themes	✓	-	✓	✓
2. Integration to EE	✓	-	✓	✓
3. Importance and link of themes to EE	✓	-	✓	✓

Teacher #5 had three out of the four documents (CAPS Policy document, assessment documents and lesson plan/preparation) documents for physical science grade 10 when the researcher visited the school for data collection. She did not have Pacesetters. CAPS Policy document, Lesson plan /preparation documents and assessment documents all had a list of EE themes. All three documents that were available showed that they all complied with the integration of EE themes. All three available documents showed the importance of EE and the themes that were linked to EE were asfollows:

- Pitch, loudness, and quality (tone)
- Electromagnetic radiation
- The hydrosphere
- Conservation of mechanical energy

Teacher #6

Subject: Life orientation

Grade: 10

Table 5.7: Document analysis teachers #6

	CAPS Policy document	Pacesetters	Lesson plan /preparation	Assessment
1. List environmental themes	✓	✓	✓	✓
2. Integration to EE	✓	✓	✓	✓
3. Importance and link of themes to EE	✓	✓	✓	✓

Teacher #6 had four documents (CAPS Policy document, Pacesetters, lesson plan/preparation, and assessment) documents for Life Orientation grade 10 when the researcher visited the school for data collection. CAPS Policy document, Pacesetters, Lesson plan /preparation documents and assessment documents all had a list of EE themes. All four documents that were available showed that they all complied with the integration of EE themes. All four documents showed the importance of EE and the themes that were linked to EE were as follows:

- Social and environmental responsibility
- Social and Environmental justice
- Unequal access to basic resources and services
- Harmful and environmental effects

Teacher #7

Subject: English first additional language

Grade: 10

Table 5.8: Document analysis teachers #7

	CAPS Policy document	Pacesetters	Lesson plan /preparation	Assessment
1. List environmental themes	✓	✓	✓	✓
2. Integration to EE	✓	✓	✓	✓
3. Importance and link of themes to EE	✓	✓	✓	✓

Teacher #7 had four documents (CAPS Policy document, pace-setters, lesson plan/preparation, and assessment) documents for English first additional language grade 10 when the researcher visited the school for data collection. CAPS Policy document, pace-setters, Lesson plan /preparation documents and assessment documents all had a list of EE themes. All four documents that were available showed that they all complied with the integration of EE themes. All four documents showed the importance of EE and the themes that were linked to EE were as follows:

- In poetry:

  ✓ Poem title: Endangered species

Author: Lionel Abrahams

Theme: Human activities leading to environmental degradation

  ✓ Poem title: Love of the land

Author: Stephen Gray

Theme: Environmental hazards (Drought)

- ✓ Poem title: Landscape is passing into language

Author: Gabeba Bederoon

Theme: preservation of natural resources and effects of drought

Teacher #8

Subject: Accounting

Grade: 10

Table 5.9: Document analysis teachers #8

	CAPS Policy document	Pacesetters	Lesson plan /preparation	Assessment
1. List environmental themes	✓	✓	✓	✓
2. Integration to EE	✓	✓	✓	✓
3. Importance and link of themes to EE	✓	✓	✓	✓

Teacher #8 had four documents (CAPS Policy document, Pacesetters, lesson plan/preparation, and assessment) documents for accounting grade 10 when the researcher visited the school for data collection. CAPS Policy document, Pacesetters, Lesson plan /preparation documents and assessment documents all had a list of EE themes. All four documents that were available showed that they all complied with the integration of EE themes. All four documents showed the importance of EE and the themes that were linked to EE were as follows:

- Management resources
- Definition and explanation of basic concepts
- Direct materials (raw materials)

Teacher #9

Subject: History

Grade: 10

Table 5.10: Document analysis teachers #5

	CAPS Policy document	Pacesetters	Lesson plan /preparation	Assessment
1. List environmental themes	✓	✓	✓	–
2. Integration to EE	✓	✓	✓	–
3. Importance and link of themes to EE	✓	✓	✓	–

Teacher #9 had three out of the four documents (CAPS Policy document, pacesetters and lesson plan/preparation) documents for History grade 10 and did not have an assessment document when the researcher visited the school for data collection. CAPS Policy document, Pacesetters and Lesson plan /preparation documents all had a list of EE themes. All three documents that were available showed that they all complied with the integration of EE themes. All three documents showed the importance of EE and the themes that were linked to EE were as follows:

- The black death (the death of many people from an unknown disease which resulted in the drop of population, disruption of the natural environment and pollution of the environment from the smell)
- Plagues and consequences

Teacher #10

Subject: agricultural sciences

Grade: 10

Table 5.11: Document analysis teachers #10

	CAPS Policy document	Pacesetters	Lesson plan /preparation	Assessment
1. List environmental themes	✓	✓	✓	X
2. Integration to EE	✓	✓	✓	✓
3. Importance and link of themes to EE	✓	✓	✓	✓

Teacher #10 had all four documents (CAPS Policy document, Pacesetters, lesson plan/preparation and assessment documents for agricultural science grade 10. CAPS Policy document, Pacesetters and Lesson plan /preparation documents all had a list of EE themes. The assessment document was the only document that did not have a list of EE themes. All four documents were showed that they all complied with the integration of EE themes. All four documents showed the importance of EE and the themes that were linked to EE were as follows:

- Agro-ecosystem
- Ecosystems
- Biomes of South Africa
- Population growth
- Sustainable resource utilisation
- Soil conservation and management
- Water management
- Water management
- Agricultural pollution

5.9 CONCLUSION

This chapter covered the following topics: Introduction, empirical data, profiling of teachers, teacher profiles, teacher profile table, face-to-face semi-structured interviews, non-participatory observation, and document analysis.

CHAPTER SIX
DATA ANALYSIS, INTERPRETATION, CONCLUSION AND RECOMMENDATIONS

6.1 INTRODUCTION

This chapter presents data analysis. Data analysis is the process of organising data in order to come up with a conclusion (Glense, 2015). Data analysis begins after data collection and ends when data collected has been evaluated. Consequently, data collection and analysis are interwoven and influence one another. With qualitative research, data analysis can be carried out through the use of three different approaches. These approaches involve inductive reasoning. The three approaches involve coding, directed content analysis and summative content analysis (Hashemnezhad, 2015). The chapter also includes the final conclusions of the study in light of the research questions and aims and recommendations for future research.

6.2 ANALYSIS OF EMPIRICAL DATA

Data analysis was carried out for data collected through both interview guides, document analysis, and non-participatory observation. The process of data analysis was carried out following three steps:

- **Step 1: Studying/becoming familiar with the data**

Firstly, the researcher read all the notes from transcribed recordings of the semi-structured interviews that were conducted. Notes were made from non-participatory observation and also from document analysis (separately) to gain an overview.

- **Step 2: Coding**

The coding process was carried out in three steps which were open coding, axial coding, and selective coding.

Open coding: this process was carried out in order to initially identify and mark descriptive names for specific units in relation to the aims, objectives and research questions of this study. During this process, the researcher organised data in a meaningful and systematic way and then grouped it under codes that were developed.

Axial coding: the codes that were developed from the previous stage were again be evaluated and modified where necessary so as to ensure that they are relevant to this study and that they represent data obtained during collection.

Elective coding: final coding was performed and a final code list was compiled

➢ **Step 3: Generating themes**

The process of generating themes was carried out through steps:

Searching for themes: The codes that were developed in the previous stage were then examined to find if there are any that fit together as a theme. At the end of this stage, the generated codes had all been organised into broader themes that were related to the research question.

Reviewing themes: The researcher then reviewed modified and developing themes that were generated in the previous stage. This was done to ensure that they make sense and does every code fit in a specific theme.

Defining themes: Here the researcher identified what each theme is about and how each theme relates to other themes.

6.3 PROFILING OF TEACHERS

The information provided by teachers to the researcher during data collection indicates that the participant teachers are well qualified to teach the subjects they were teaching since they had qualifications ranging from teachers' diplomas to Master in Education. According to Lin and Magnuson (2018), there is an association between a teacher's level of education or qualifications and their

performance in the classroom. Teachers who are qualified for the subject they teach perform better in those subjects than those who are not qualified. Therefore, it can be concluded that being qualified served as a factor that enhances the teacher's proficiency in integrating EE themes into CAPS subjects.

A gender gap in the integration of EE themes was observed with seven of the participants being female and only three males. Therefore, it can be concluded that it is mostly female teachers who integrate EE themes in their subjects than male teachers. However, this conflicts findings obtained by Ozgul *et al.* (2018) wherein it was found that gender of teachers had no effects on their attitude towards EE and would, therefore, have no effect on the integration of EE themes in their subjects.

Teachers involved in this study had teaching experience ranging from six to twenty-eight years. This, therefore, indicates that teachers were able to integrate EE themes, hence all teachers indicated that they were able to integrate EE themes in their subjects. This is also supported by Kini and Podolsky (2016), who state that teachers with more experience are likely to acquire required skills rapidly and seamlessly as compared to teachers with less or no experience in teaching. In view of the challenges facing teachers in the integration of curriculum, Ormond (2017) also confirms by stating that the curriculum requires a high level of knowledge and expertise from teachers.

None of the teachers in the study had received any training to integrate EE themes in their subjects. With the changing curriculum, teacher training is essential and when no training is offered, it affects the teacher's ability to integrate EE in subjects. A new curriculum requires new knowledge, experts in the new policy, willingness and commitment from teachers to meet its goals and objectives; lack of teacher training leads to inadequate knowledge of environmental issues and problems to learners. There- fore, it can be concluded that training is essential and should be offered continuously to help teachers in the integration of EE themes and to empower them so that they can handle challenges they face in integrating EE themes in their subjects.

6.4 SEMI-STRUCTURED INTERVIEW

Following the steps in content data analysis process, themes were generated from responses given by the teachers in order to answer the three research questions focused on method and approaches used in teaching and learning, success and challenges of integrating EE themes into CAPS subjects and strategies to enhance teacher proficiency on integrating EE themes in subjects.

6.4.1 Methods and approaches used in teaching and learning

(a) In response to question one which concerned the subjects and grade that the teacher is currently teaching, the following themes emerged:

➢ **Teaching EE in different subjects**

All teachers in this study were teaching different subjects in grade 10. It can, therefore, be concluded that because EE themes are broad and need to be narrowed in different subjects to cover as many of them as possible, this was being achieved by teachers in the current study. This supports Kimiti and Kipkoech (2013) who stated that all teachers have to integrate EE in their different subjects. Subjects taught were from different groups which included sciences, humanities, languages and cultural and technological subjects (Was Nam, 2011). Thus, it can be concluded that teachers are able to integrate EE themes in different subjects.

➢ **Single grade teachers**

Only two of the teachers were single-grade teachers (teaching only grade 10). Teachers who teach only one class usually have less workload than those who teach more than one grade. It can, therefore, be concluded that most teachers (8) in this study had a large workload as they teach more than one class. When teachers have less workload, they and their learners perform better as they have more time to do revision and give extra lessons compared to those who teach more than one class.

➢ **Multi-grade teachers**

Eight out of the ten teacher participants were multi-grade teachers with three of the teachers teaching grades 10 to 12, three teaching grades 9 to 11 and two teaching grades 10 and 12. Multi-grade teaching often occurs where there are overcrowded schools or a shortage of teachers. Multi-grading usually results in work overload for teachers and influences the integration of EE themes as teachers face great responsibility and end up not integrating some themes due to time. This is supported by Khan (2016) who states that multi-grade teaching affects both teacher and learner as it increases teacher's workload affecting how the teacher teaches. Adeolu and Arinze (2018), also confirm that teacher workload affects performance and impacts on learner's academic performances.

(b) Concerning the methods and or approaches used in teaching and learning, the following themes were generated from teachers' responses:

➢ **Teacher-centred approach and learner-centered approach**

Teachers' responses indicated that they were familiar with teacher-centered approaches. Teachers' responses also indicated that they were familiar with learner-centered approaches. Different EE themes may require the knowledge and use of different approaches used in teaching and learning. The response given by teachers in this study showed that they had knowledge of different approaches. It can, therefore, be concluded that they were able to select the appropriate approach to integrating different EE themes as they know the approaches and how they can be best used to enhance proficiency. This is confirmed by Kimiti and Kipkoech (2013) who stated that the effectiveness of the implementation of the school curriculum depends on the use of appropriate teaching and learning approaches.

(c) In response to teaching and learning approaches that teachers thought were most suitable, the following themes emerged:

➢ **Teacher-centered approach**

Most teachers in this study indicated that the teacher-centered approach is the most suitable. Teacher-centered approaches do not allow for active learning as the teacher takes control of the lesson and the learners are only recipients. This implies that teachers integrate EE themes in their subjects in ways that do not enhance learners' understanding. This confirms Ketlhoilwe's (2013) view that a better understanding by learners is enhanced by teaching methods that boost learner participation.

According to the response of teachers from this study, factors such as overcrowded classes and lack of resources encourage teacher-centered approaches. Kimiti and Kipkoech (2013) state that certain factors determine which approaches are suitable. All teachers from this study were from public schools which are often poorly resourced and over-crowded. This does not promote the use of learner-centered approaches. Hence teachers felt that the teacher-centered approach is the most suitable.

➢ **Learner-centered approach**

Few teachers indicated that the learner-centered approach was the most suitable. This means that the enhancement of learner understanding is limited in many subjects where EE themes are integrated. Ketlhoilwe (2013) concurs that the use of the learner-centered approach allows for a better understanding of the content by learners as they are more involved in their learning as compared to teacher-centered approaches.

➢ **Other contributory factors**

The response given by some teachers indicated that the most suitable approach for the integration of EE themes in their subjects is not always the same and maybe

determined by factors such as availability of resources and the particular content being covered.

(d) When asked to describe theories that are commonly used in teaching and learning

➢ **Place-based knowledge and lack of knowledge and what it means**

The response given by most teachers indicated that they had knowledge about PBL theory and how to apply it in their different subjects when integrating EE themes. The knowledge of PBL and its application enhances proficiency in the integration of EE. Through the application of PBL, learners could understand the content even better. This view was supported by Gruenewald (2014) who argues that PBL focuses on the concept of place or the environment as an integrating context across disciplines in order to promote learner-centered problem-solving skills.

One of the objectives of EE is to equip learners with the environmental knowledge necessary to turn them into environmentally conscious beings. PBL helps learners to develop stronger ties with and appreciation of their environment. Therefore, through the application of this theory teachers can achieve that goal.

➢ **Social constructivism**

The response given by teachers with regard to SC indicated that most had the knowledge and were able to apply SC in their different subjects when integrating EE themes. SC is a useful theoretical framework and gives insight necessary for teachers to integrate EE based on how learners interact with the real world. Also, SC gives an opportunity for teachers and learners to work together using social media to share knowledge and expertise. This makes the integration of EE themes even simpler but only for those teachers who are able to use social media.

➢ **Outdoor experiential learning**

Most teachers had knowledge about outdoor experiential learning theory. Experiential learning goes beyond theory as it allows for practical activities and active learning. Such activities help learners understand the theory better. Hence it can be concluded that teachers' knowledge of and experience in experiential theory enhanced their proficiency and learners' understanding of EE. Learners also enjoy practical work and participate more as compared to the normal way of learning, therefore when teachers are able to apply this theory they stimulate learner involvement.

➢ **Connectivism**

The response of teachers indicated that most did not have knowledge about connectivity theory. This, therefore, means that we're not applying it in their different subjects when integrating EE themes. Connectivism involves learning through the use of information sources that are connected to the environment and that learning and knowledge are based on diverse opinions. The use of learning sources in the integration of EE themes facilitates the teaching and learning process. Therefore, when teachers are unable to apply these themes in their different subjects, it creates challenges that could have been avoided.

(e) The following themes emerged from teachers' responses concerning which of the following themes they apply when teaching

➢ **Ability to apply all theories**

Certain teachers' responses indicated that they apply all these theories. The application of all theories allows for better integration of EE themes in CAPS subjects when there is an understanding of such themes.

➢ **Application of certain knowledge**

Most teachers indicated the use of outdoor and experiential theory. This could be because they understand only the theories that they apply.

➢ **Inability to identify a theory in use**

With teachers are unable to identify the theory they apply, it could affect their integration of EE themes. They lack understanding of theory and this could also result in the use of incorrect theories.

6.4.2 Challenges and success of integrating EE themes in subjects

(a) In response to whether teachers have relevant CAPS documents for their subjects, the following themes emerged:

➢ **Availability of CAPS documents**

All teachers in the current study indicated that they had relevant CAPS documents. CAPS documents play a vital role in providing guidance to teachers on how to integrate EE themes and assess learners. The availability of relevant documents helps in the enhancement of teacher proficiency in the integration of EE themes in their subjects.

(b) Need to integrate EE in subjects

➢ **Positive attitude towards the integration of EE themes by teachers**

In the current study, all teachers indicated that they feel EE themes should be integrated into their subjects. Therefore, it can be concluded that their attitudes towards integrating EE themes in their different subjects were positive. A positive attitude is also a determinant in the success of EE. When a teacher's attitude towards the integration of EE themes is negative, they may choose not to integrate EE themes at all in their subjects or to integrate only certain EE themes. This is confirmed by Hebe (2017) who indicates that some teachers perceive certain themes of EE unimportant due to the areas in which their schools are based.

(c) Teachers' ability to integrate EE themes

Information obtained from the current study indicates that teachers were able to apply EE themes in their different subjects. This might be because of the available CAPS documents that provide guidance to the teachers, their ability to apply certain learning and teaching theories and also the knowledge and ability to use relevant teaching and learning approaches as indicated by the teachers.

(d) The challenges teachers face when integrating EE in their subjects

➢ Slow learning process

Challenges teachers were faced with the integration of EE themes in their subjects, such as overcrowding and lack of resources in schools, results in a slow tempo of the learning process. For example, if in a certain class there are insufficient textbooks, learners have to share or textbooks must be passed around and this is time-consuming. Lack of visual learning aids also hinders effective learning.

➢ Poor learner involvement and understanding in overcrowded classes

Information provided by teachers indicates that when classes are overcrowded, it affects learners' involvement and participation. Too many learners in a class give rise to misconduct and a distracting focus on the lesson which may affect grades. In overcrowded classes, it is difficult for the teacher to move around to ensure that all learners understand what is being taught. When classes are overcrowded it affects the distribution of learning resources. Shirley (2017) states that in overcrowded classes, teachers are faced with the responsibility of having to meet the needs of more students and with fewer resources

➢ **Lack of relevant resources**

Teachers from this study indicated that lack of resources such as finance, books, and other learning materials was a challenge they face when integrating EE themes in their subjects. Most teachers were from schools based in rural areas and all the schools were public schools. Lack of resources in such schools often results from poor funding, poor organization and improper policy implementation. Adequate funding is an essential element in the enhancement of integrating EE in the school curriculum. Poor funding of education does not only affect learners but also teachers as it makes it difficult to transmit knowledge to learners.

(e) The implications of overcrowding and lack of resources

➢ **No individual focus**

Too many learners in one class hinder individual attention to learners to ensure that they understand what is being taught. Shirley (2017) concurs that some learners may require individual focus from the teacher during a lesson. This is time-consuming in a large class and affects the schedule.

➢ **Lack of content understanding**

Resources such as textbooks, pamphlets, and videos serve as teaching aids and are necessary for enhancing learners' understanding of the content. Some lessons may require practical work or field trips in order for the learners to understand and experience what is being taught. Lack of financial resources excludes field trips and makes it difficult to buy the necessary educational equipment and learning aids.

➢ **The teaching of certain themes**

Lack of resources might result in limiting teachers to certain themes that do not require any resources or only those that the school can afford. Some themes may require

learner-centred teaching approaches such as discussion or presentation by learners which is difficult and time-consuming in overcrowded classes.

(f) Implications of not teaching EE themes to learners

➢ Lack of environmental knowledge in future generations

Environmental education is intended to ensure that learners know about their environment and to create consciously and promote the sustainability of the environment through learners' everyday activities. If EE is not taught, learners will be uninformed about their environment. Gough (2013) concurs that EE leads to citizens with knowledge of the biophysical environment and the problems associated with it.

➢ Environmental degradation

Lack of EE may result in environmental degradation because people's knowledge influences their actions. This is also confirmed by Gosh (2014) who states that EE is a progression of learning where people's knowledge of environmental challenges, solutions and prevention of challenges (e.g., pollution which leads to environmental degradation) is increased.

(g) Benefits if all teachers could integrate EE themes in their subjects

➢ Environmentally conscious learners

According to teachers in this study, If all teachers could integrate EE themes in their subjects, it would result In learners who are environmentally conscious. Otto and Pensini (2017) concur that EE increases awareness of conservation issues which improves attitudes towards the environment. Often EE is aimed at children with the assumption that this will eventually impact adults through the intergenerational transfer of knowledge and attitudes

➢ **Clean community and schools**

Through EE not only learners but the community as a whole can be empowered to be environmentally sustainable beings who take care of their environment and keep it clean at all times.

6.4.3 Strategies to enhance teachers' proficiency towards integrating EE themes into their subjects

(a) Need for teachers to receive training on how to integrate EE themes into CAPS subjects

The responses given by teachers indicate that the need for teacher training on how to integrate EE themes in their subjects. This would enable them to deal with challenges they encounter, engender positive teacher attitudes towards EE and boost their esteem in the classroom. Teachers stated that a positive attitude is a determinant in the success of EE.

(b) Teachers' proposals to their head of department, deputy principal and or principal, regarding:

➢ **Lesson planning,**

Lesson planning helps teachers identify beforehand what is needed for their lesson, how they will carry out their lesson and how they will assess learning. This prepares them to deal with potential challenges, ensures the smooth running of the lesson and enhances their proficiency in the integration of EE themes.

➢ **Teaching methods or approaches**

According to teachers' responses, learner-centered approaches should be used more often to promote active learning. Hence, Kimiti and Kipkoech (2013) stress the need for teachers to master these approaches.

➢ **How to assess learners**

Learners should be thoroughly and frequently assessed in order for teachers to be able to identify their progress and areas which require attention.

(c) Other stakeholders that you think should be involved to enhance teacher proficiency in integrating EE themes into their subjects

➢ **Department of Agriculture**

The Department of Agriculture should play a vital role in equipping people with environmental knowledge. Their involvement would improve the integration of EE themes as it would make teachers take EE more seriously, address shortages of funding thereby increasing learners' interest and participation in EE and expand learners' career choices.

(d) Need for EE to be introduced as a CAPS subject

➢ **Increased burden on resourcing**

Some teachers felt that introducing EE as a subject would increase teachers' workload as EE may require a separate period, additional resources, teaching staff, funding for practical activities and field trips and additional classes in some schools.

➢ **Better integration of themes**

Most teachers felt the need for EE to be introduced as a subject on its own as this would cover all the EE themes.

6.5 DOCUMENT ANALYSIS

Based on the information obtained during data analysis, the following themes emerged:

(a) Availability of EE theme list

Documents that were analysed had a list of EE themes to be integrated by teachers in their different subjects. This served as guidance to teachers thus easing their work, assists teacher preparation for every theme and allows them to collect required resources beforehand.

(b) Integration of EE

The documents provide guidance to teachers on the integration of themes. This helps teachers integrate these themes more effectively since teachers were not specifically trained to do the integration.

(c) Linking of themes to EE

A list of all themes was available for all subjects and which ones could be linked to EE. This plays a vital role in encouraging teachers to integrate all themes and not view some as less important or irrelevant.

6.6 NON-PARTICIPATORY OBSERVATION

Based on the information obtained by non-participatory observation, the following themes emerged:

➢ Adherence to lesson plan

Teachers showed the ability to adhere to their lesson plans. This promotes the teaching and learning process because teachers are prepared and do not introduce new features during the lesson.

➢ **Promotion of learners' participation**

Teachers were able to stimulate learners' participation through their teaching approach and through asking questions. This helped learners grasp the content more effectively. This confirms Ketlhoilwe (2013) who states that learner understanding is enhanced by teaching methods that boost learner participation.

➢ **Lack of time**

Due to lack of time, many activities are compromised during the integration of EE themes in subjects. Time influences the teaching approach. For example, most teachers chose a teacher-centered approach instead of a learner-centered approach because the latter requires more time. Assessment and feedback are usually omitted in the lesson due to time constraints; these are important factors in the integration of EE themes.

6.7 RECOMMENDATIONS

Based on the findings of this study, the following recommendations were drawn:

- ➢ Training and support must be offered to teachers to empower them to deal with challenges they encounter when integrating EE themes in their subjects and assist them to devise more effective ways of integration that will inspire positive learner attitudes to EE. The training should also touch on methods of teaching and theories foregrounding EE integration.
- ➢ More stakeholders should be involved in the integration of EE. Stakeholders should include those who can intervene financially so as to address the lack of resources.

6.8 CONCLUSION

For the purpose of this study, data was collected and analysed in order to answer four main research questions which were:

1.1. What are specific theories foregrounding the integration of EE themes into CAPS subjects?

Different theories foreground the integration of EE themes in different subjects. These include PBL, SC, experiential/outdoor learning and connectivism. Teachers' knowledge of theories foregrounding the integration of EE was explored. It was found that most teachers had knowledge of PBL, SC, and outdoor experiential learning and could apply them in the integration of EE in their different subjects.

1.2. To what extent, are teachers trained or empowered to integrate EE themes into CAPS subjects/ the strategies to enhance teachers' proficiency in integrating EE themes in their subjects?

The training of teachers, prior lesson planning, involving other stakeholders, theoretical knowledge and proper application of teaching and learning methods is essential. Teachers in this study were not trained to integrate EE themes in their subjects. How- ever, teachers had lesson plans and adhered to them during their lessons. Some teachers emphasised the importance of a lesson plan by proposing that teachers should always have a lesson plan before every lesson as this enhances their proficiency. Teachers identified community leaders and the Department of Environmental affairs as stakeholders that can be involved to enhance their proficiency in integrating EE themes in their subjects. Teachers had knowledge about different teaching and learning methods, although they preferred a teacher-entered approach, and were able to apply them.

1.3. What are the successes and challenges in integrating EE themes into CAPS?

Factors identified as those that ensure the success of the integration of EE were the availability of CAPS documents and teachers' positive attitudes towards the integration of EE themes in their subjects. These factors allowed teachers to integrate EE themes accordingly and enhanced the proficiency of teachers in integrating EE themes.

Challenges in integrating EE themes included overcrowded classes, lack of suitable resources, poor learner involvement and understanding, overcrowding which hindered individual attention to needy learners and teachers who were limited to certain EE themes due to a lack of resources and/or finance.

REFERENCES

Adeolu, J.A. and Arinze, P. 2018. Teachers' instructional workload management and students' academic performance in public and private secondary schools in Akoko North-East Local Government, Ondo State Nigeria. *American International Journal of Education and Linguistics Research* 1(1).

Akdeniz, C., Bacanlı, H., Baysen, E., Çakmak, M., Çeliköz, N., Doğruer, N. and Yalın, H.I. 2016. *Learning and teaching: Theories approaches and models. Cozum, Turkiye*.

Alsamani, A.A. 2016. Introducing project-based instruction in the Saudi ESP classroom: a study in Qassim University. *English language teaching* 9(1).

Alvarez-Garcia, O., Sureda-Negre, J. and Comas-Forgas, R. 2015. Environmental education in pre-service teacher training: a literature review of existing evidence. *Journal of the teacher education for sustainability, 17(2).*

Amineh, R.J., and Asl, H.D., 2015. Review of constructivism and social constructivism. *Journal of Social Sciences, Literature, and Languages*, *1*(1)

Best, J.W. and Kahn, J.V., 2016. *Research in education*. Pearson Education India.

Bertram, C. and Christiansen, I., 2014. Understanding research. *An introduction to reading research. Pretoria: Van Schaik Publishers*.

Blyth, C. and Meiring, R. 2018. A post humanist approach to EE in South Africa: implications for teachers, teacher development and teacher training programs. *Teacher development,* 22(1).

Bosah, V.O. 2013. Environmental Education in Nigeria: issues challenges and prospects. *Mediterranean Journal of Social Sciences*, 4(15). Ciroth *et al.*, 2011 EE curriculum

Creswell, J.W. and Clark, V.L.P. 2017. *Designing and conducting mixed methods research*. Sage publications.

Daskolia, M., Dimos, A. and Kampylis, P.G., 2012. Secondary Teachers' Conceptions of Creative Thinking within the Context of Environmental Education. *International Journal of Environmental and Science Education*, *7*(2).

De Vos, A.S., Strydom, H., Fouche, C.B. and Delport, C.S.L. 2016. Building a scientific base for the helping professions. Research at the grassroots for the social sciences and human service professions. Van Schaick, Pretoria.

Demarest, A.B. 2014. Place-based curriculum design: exceeding standards through local investigations. Routledge.

Edwards, R., Fenwick, T., and Sawchuk, P. 2015. *Emerging approaches to educational research: Tracing the socio-material*. Routledge.

Easterby-Smith, M., Thorpe, R. and Jackson, P.R., 2012. *Management research*. Sage.

Le Roux, C. and Ferreira, J.G., 2005. Enhancing environmental education teaching skills through In-Service Education and Training. *Journal of Education for Teaching*, *31*(1).

Flick, U. ed., 2017. *The Sage handbook of qualitative data collection*. Sage.

Florian, L. and Spratt, J., 2013. Enacting inclusion: A framework for interrogating inclusive practice. *European Journal of Special Needs Education*, *28*(2).

Ghosh, K. 2014. Environmental awareness among secondary school students of Golaghat district in the state of Assam and their attitude towards Environmental Education. *IOSR Journal of Humanities and Social Science*, *19*(3).

Glense, C. 2015. *Becoming qualitative researchers: An introduction*. Pearson (2015).

Goodall, S. 2018. *Developing Environmental education in the curriculum.* Routledge

Gough, A., 2013. The emergence of Environmental Education research. *International Handbook of Research on Environmental Education.* New York: Routledge.

Gosselin, D., Brian, S., Lutz, T. and Maxson, J. 2016. Integrating geoscience into undergraduate education about the environment, society, and sustainability using PBL: three examples. *Journal of environmental studies and sciences* 6(3).

Gruenewald, D.A. 2014. Place-based education: Grounding culturally responsive teaching in geographical diversity. In *Place-based education in the global age*. Routledge.

Hashemnezhad, H., 2015. Qualitative content analysis research: A review article. *Journal of the ELT and applied linguistics (JELTAL), 3(1).*

Hebe, H.N., 2017. Towards a Theory-driven Integration of Environmental Education: the application of Piaget and Vygotsky in Grade R. *international journal of environmental and science education* 1(1).

Huang, T.C., Chen, C.C. and Chou, Y.W. 2016. Animating Eco-education: To see feel, and discover in an augmented reality-based experiential learning environment. *Computers and education*, 96.

Ketlhoilwe, M.J. 2013. Governmentality in Environmental Education policy dis-courses: A qualitative study of teachers in Botswana. *International Research in Geographical and Environmental Education*, *22*(4).

Khan, S. 2016. The impact of multi-grade teaching on students 'performance at the elementary level in Khyber Pakhtunkhwa. Doctoral dissertation, Northern University, Nowshera.

Kimiti, R. and Kipkoech, L. 2013. *The benefits of mainstreaming EE in the school curriculum. Research Journal in Organizational Psychology and Educational studies* 2(2).

Kini, T. and Podolsky, A. 2016. Does teaching experience increase teacher effectiveness. *A Review of the Research (2016):15*.

Kisoglu, M., Gurbuz, H., Erkol, M., Akar, M.S. and Akilli, M. 2017. Prospective Turkish elementary science teachers' knowledge level about the greenhouse effects and their views on Environmental Education in university. *International electronic journal of elementary education,* 2(2*).*

Knapp, C.E. 2014. Place-based curricular and pedagogical models: My adventures in teaching through community contexts. In *Place-based education in the global age*. Routledge.

Kolb, D.A. 2014. *Experiential learning: Experience as the source of learning and development*. Pearson Education.

Lam, W.N., 2011. Environmental education in the secondary schools of Hong Kong.

Liefländer, A.K., Fröhlich, G., Bogner, F.X. and Schultz, P.W. 2013. Promoting connectedness with nature through Environmental Education. *Environmental Education Research*, *19*(3).

Lin, Y.C.and Magnuson, K.A. 2018. Classroom quality and children's academic skills in child care centers: Understanding the role of teacher qualifications. *Early childhood research quarterly,* 42.

Lotz-Sisitka, H.B. 2014. *Positioning southern African Environmental Education in a changing context*. Howick: Share-Net.

Lozanol, R., Lukman, R., Lozano, F.J., Huisingh, D. and Lambrechts, W. 2013. Declarations for sustainability in higher education: becoming better leaders, through addressing the university system. *Journal of Cleaner Production*, *48*.

Markaki, V. (2014). Environmental education through inquiry and technology. Science Education International, 25(1)

McLeod, S.A. 2013. Kolb-learning styles. Retrieved from www.simplypychology.org/learning-kolb.htlm accessed 28 June 2019.

Mnguni, L. 2013. The curriculum ideology of the South African secondary school Biology. *South African Journal of Education; 33*(2).

Mokhele, P.R. 2012. Dealing with the challenges of curriculum implementation: lessons from rural secondary schools. *African Journal of Governance and Development, 1.*

Moon, J.A. 2013. *A handbook of reflective and experiential learning: Theory and practice*. Routledge.

Muniyappan, D. and Sivakumar, P. 2018. Social constructivism perspectives on the teaching-learning process*. Paripex-Indian journal of research*, *7*(2).

Mustam, B. and Daniel, E.S. 2018. Informal and Formal Environmental Education *Infusion: Actions of Malaysian Teachers and parents among students in the polluted area. MOJES: Malaysian Online Journal of Educational Sciences, 4(1).*

O'Byrne, D., Dripps, W. and Nicholas, K.A. 2015. Teaching and learning sustainability: An assessment of the curriculum content and structure of sustainability degree programs in higher education. *Sustainability Science*, *10*(1).

O'Donoghue, R. 2013. *Framing Active Teaching and Learning in CAPS*. Fundisa for Change Programme. Environmental Learning Research Centre, Rhodes University, Graham's town, and GIZ Expert Net.

Osbasoro, C.B, Oyinloye, O.A and Ilesanmi, A.A. 2012. The importance of EE to Secondary School level in Akure South Local Government Area, Ondo State, Nigeria. *African Research Review, 7(1).*

Otto, S. and Pensini, P. 2017. Nature-based EE of children: Environmental knowledge and connectedness to nature, together, are related to ecological behaviour. *Global Environmental Change*, *47*.

Ormond, B.M. 2017. Curriculum decisions-the challenges of teacher autonomy over knowledge selection for history. *Journal of curriculum studies*, 49(5).

Ozgul, F., Kangalgil, M., Diker, G. and Yamen, E., 2018. European Journal of Educational Research. *Evaluation*, *7*(3).

Piercy, N. 2013. Evaluating experiential learning in the business context: contributions to group-based and cross-functional working. *Innovation in education teaching and learning international,* 50(2).

Pritchard, A. and Woollard, J., 2013. *Psychology for the Classroom: Constructivism and social learning*. Routledge.

Rubin, A. and Babbie, E.R. (2016). *Empowerment Series: Research Methods for Social Work*. Cengage Learning.

Ruutmann, T. and Kipper, H. 2011. Teaching strategies for direct and indirect instruction in teaching engineering. Interactive Collaborative Learning (ICL), 2011, 14th international conference.

Salleh, M.F.H., Zuki, N.H.M, Ismail, M.H. and Adbullah, N. 2016. Secondary school students' knowledge and awareness of environmental issues. Paper in *Proceedings of 7th international conference on the University Learning and Teaching (InCULT 2014)*. Singapore: Springer.

Semken, S., Ward, E.G., Moosavi, S. and Chinn, P.W., 2017. Place-based education in geoscience: Theory, research, practice, and assessment. *Journal of Geoscience Education*, *65*(4).

Schudel, I. 2014. Exploring a knowledge-focused trajectory for researching environmental learning in the South African curriculum. *Southern African*

Journal of Environmental Education, *30*.

Shirley, M., 2017. The Effects of Overcrowding on Student Academic Performance in Kentucky High Schools. MPA/MPP Capstone Projects, 283.

Siemens, G. 2015. Connectivism: a learning theory for the digital age.

Siemens, S. and Jansen, R. 2015. September: Connectivism and interactionism reloaded knowledge networks in the cloud. Paper at International workshop on Learning Technology for Education in Cloud. Cham: Springer.

Smith, G.A. and Sobel, D. 2014. *Place-and community-based education in schools*. Routledge.

Sokolowski, R., 2017. *Moral action: A phenomenological study*. CUA Press.

Tal, T. and Abramovitch, A. 2013. Activity and action: Bridging environmental sciences and EE. *Research in Science Education*, *43*(4).

Tshautshau, A., 2013. Folk EIA: a useful but often neglected tool.

Viswambharan, A.P., and Priya, K.R., 2016. Documentary analysis as a qualitative methodology to explore disaster mental health: insights from analysing a documentary on communal riots. *Qualitative research*, *16*(1).

Walker, N., 2012. *MacCormick's Scotland*. Edinburgh University Press.

Würdinger, S.D. and Carlson, J.A., 2010. Teaching for experiential learning: Five approaches.

APPENDIX A: DOCUMENTS ANALYSIS INSTRUMENT

Teachers' perceptions of environmental education integration in grade 10 subjects in selected Thohoyandou secondary schools.

	CAPS Policy document	Pacesetters	Lesson plan /preparation	Assessment
4. List environmental themes				
5. Integration to EE				
6. Subject				
7. Importance and link of themes to EE				

APPENDIX B: OBSERVATION SCHEDULE

Date:_____

Venue:_____

Subject:_____

EE theme:_____

FACTORS OBSERVED	**FINDINGS**	
TEACHERS PLANNING	Evidence of lesson planning	Adherence to lesson plan
PRESENTATION	Introduction	Teaching method
LEARNER'S INVOLVEMENT	Participation in lesson (Responding to questions)	Asking teacher questions (asking clarity seeking questions)
CONCLUSION		
ASSESSMENT	Type of assessment	Effectiveness

APPENDIX C: SEMI-STRUCTURED INTERVIEWS QUESTIONNAIRE

Confirmation of signing the consent form

The researcher will read the below information:

I am Vhulahani Patrick Tshivhase and would like to know if you have read and signed the consent form as a participant of this research study. Please indicate by saying yes or No before we can proceed with this interview. There are four main questions that you are requested to respond to.

Question 1: Teachers demographic information

1. Please indicate your gender.
2. For how long have you been working as a teacher?
3. Would you please indicate your highest qualification?
4. Have you received any training on integrating environmental education themes into your subject?
5. If yes, state the organiser, duration and how informative the training was.

Question 2: Methods and or approaches used in teaching and learning

2.1. Please indicate the subjects and grades that you are teaching.

2.2. What teaching methods or approaches are you familiar with?

2.3. Are there any other teaching methods or approaches that you think are most suitable in teaching and learning? if yes, mention them

2.4. There are theories that are commonly used in teaching and learning. in your own words, how would describe the following teaching and learning theories in education:

a) place-based,

b) social-constructivism,

c) outdoor experiential learning, and

d) connectivism.

2.5. Which one do you apply when teaching? give reasons

Question 3: Challenges and benefits of integrating EE themes into CAPS subjects

3.1. Do you have the relevant CAPS document for the subjects that you are allocated to teach?

3.2. According to your knowledge, are EE themes supposed to be integrated into your CAPS subject?

3.3. Are you able to integrate environmental education themes into your subject? Substitute your answer.

3.4. Are there any challenges you experience with regard to the integration of environmental Education themes into your subject? If yes, mention those challenges.

3.5. In most of the South African schools, overcrowding, and lack of resources are Some the hindrance of proper teaching and learning. what do you think could be the implications of overcrowding and lack of resources in integrating EE themes into your subjects?

3.7. What do you think could be the implications of not teaching environmental education themes to learners?

3.8. In your view, if all teachers in your school can integrate EE themes into their subjects, what could be the benefits:

a) to the learners,
b) the school, and
c) the local environment?

Question 4: Strategies to enhance teachers' proficiency in integrating EE themes into their subjects

4.1. In your view, is there any for teachers to receive training on how to integrate EE themes into CAPS subjects? Elaborate your answer

4.2. Considering the benefits of integrating EE themes into CAPS subjects, what would you propose to your head of department, deputy principal and or principal, regarding:

a) lesson planning,
b) teaching methods or approaches, and
c) how to assess learners

4.2. Who are the other stakeholders that you think should be involved to enhance teachers' proficiency in integrating EE themes into their subjects? Support your answer

4.3. Is there any need for environmental education to be introduced as a CAPS subject? Give reasons

APPENDIX D: PARTICIPANT INFORMATION SHEET

Date: _____

Title: Teachers' perceptions of environmental education integration in grade 10 subjects in selected

Thohoyandou secondary schools.

DEAR PROSPECTIVE PARTICIPANT

My name is Vhulahani Patrick Tshivhase and I am doing research under the supervision of Dr. Ailwei Solomon Mawela, a lecturer in the Department of Curriculum and Instructional Studies towards a Master of Education Degree at the University of South Africa. We have no funding to sponsor this study. We are inviting you to participate in a study entitled "Teachers' perceptions of environmental education integration in grade 10 subjects in selected Thohoyandou secondary schools".

WHAT IS THE PURPOSE OF THE STUDY?

This study is expected to collect important information that could explore teachers' views on the integration of environmental education themes in CAPS subjects at school.

WHY AM I BEING INVITED TO PARTICIPATE?

You are invited because you are currently teaching CAPS subjects that require the integration of Environmental Education themes as my study focuses on the EE themes integration. I obtained your contact details from your school principal. The total number of participants in this study is 20.

WHAT IS THE NATURE OF MY PARTICIPATION IN THIS STUDY?

You are expected to respond to the face-face semi-structured interview questions. For the purpose of gathering information, a tape recorder will be used to record our conversation, which will later be transcribed. During the interview, you will be expected to respond to questions that are in line with Confirmation of signing the consent form; Teachers demographic information; Methods and or approaches used in teaching and learning; Challenges and benefits of integrating EE themes into CAPS subjects; and Strategies to enhance teachers' proficiency towards integrating EE themes into their subjects. Despite the face to face interviews, follow up interviews regarding document analysis pertaining to the integration of EE themes into the CAPS document will be conducted. The researcher will further conduct a non-participatory observation in which field notes will be taken.

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

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

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

There are no benefits for the participants and participation in the study is voluntary.

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

The researcher does not anticipate any harm or negative consequences for you as a participant in this study. However, if any unforeseen harm or negative consequences may take place, such, will be reported to the relevant stakeholders such as UNISA Ethics Committee through a written report.

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

Your name will not be recorded anywhere and no one will be able to connect you to the answers you give. Your answers will be given a code number or a pseudonym and

you will be referred to in this way in the data, any publications, or other research reporting methods such as conference proceedings. A report of the study may also be submitted for publication, but individual participants will not be identifiable in such a report.

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

Hard copies of your answers will be stored by the researcher for a period of five years in a locked cupboard/filing cabinet at the supervisor office, and or researcher's home for future research or academic purposes; electronic information will be stored on a password-protected computer. Future use of the stored data will be subject to further Research Ethics Review and approval if applicable. If necessary, hard copies will be shredded and/or electronic copies will be permanently deleted from the hard drive of the computer through the use of a relevant software programme.

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

You will not receive any payments for taking part in this research.

HAS THE STUDY RECEIVED ETHICS APPROVAL

This study has received written approval from the Research Ethics Review Committee of the CEDU research ethics, Unisa. A copy of the approval letter can be obtained from the researcher if you so wish.

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

If you would like to be informed of the final research findings, please contact Vhulahani Patrick Tshivhase at 082 785 1350 or email vhulahanipatrick@gmail.com . The findings are accessible for three years.

Should you have concerns about the way in which the research has been conducted, you may contact Dr. AS Mawela at 0124294381 or email: mawelas@unisa.ac.za

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

Thank you.

_____

(insert signature)

_____

(type your name)

APPENDIX E: CONSENT FORM

Title: Teachers' perceptions of environmental education integration in grade 10 subjects in selected Thohoyandou secondary schools.

I,_____(participant name), confirm that the person asking my consent to take part in this research has told me about the nature, procedure, potential benefits and anticipated inconvenience of participation.

I have read (or had explained to me) and understood the study as explained in the information sheet.

I have had sufficient opportunity to ask questions and am prepared to participate in the study.

I understand that my participation is voluntary and that I am free to withdraw at any time without penalty (if applicable).

I am aware that the findings of this study will be processed into a research report, journal publications and/or conference proceedings, but that my participation will be kept confidential unless otherwise specified.
I agree with the recording of the questionnaire/ interview.

I have received a signed copy of the informed consent agreement.
Participant Name and Surname (please print)

_____

_____ _____

Participant Signature Date

Researcher’s Name & Surname (please print)

_____ _____

Researcher’s signature Date

APPENDIX F: REQUISITION LETTER (DISTRICT)

P.O Box 2188
Thohoyandou
0950
……..

District senior manager
Department of education
Vhembe district
Sibasa
0970

Dear Sir/Madam

APPLICATION: REQUEST FOR PERMISSION TO CONDUCT AN EDUCATIONAL RESEARCH

1. The above matters refer:

2. I am currently pursuing my master's degree through the University of South Africa in the field of education. I am hereby applying for permission to conduct a research study in Schools within Mvudi and Dzindi circuit.

3. This educational research will be conducted at four secondary schools that will be sampled from those two circuits.

4. My research topic is Teachers' perceptions of environmental education integration in grade 10 subjects in selected Thohoyandou secondary schools**.**

5. Hoping that you find this in order.

Yours faithfully

Tshivhase V.P

……

APPENDIX G: REQUISITION LETTER (CIRCUIT)

P.O Box 2188
Thohoyandou
0950

31 May 2018

The Circuit Manager
Dzindi Circuit
Thohoiyandou
0950

Dear Sir/Madam

APPLICATION: REQUEST FOR PERMISSION TO CONDUCT AN EDUCATIONAL RESEARCH IN YOUR CIRCUIT

My name is Vhulahani Patrick Tshivhase and I am doing research under the supervision of **Dr. Ailwei Solomon Mawela**, a lecturer in the Department of Curriculum and Instructional Studies towards a Master of Education Degree at the University of South Africa. We have no funding to sponsor this study. We are requestiong permission to conduct research in a study entitled ***"Teachers' perceptions of environmental education integration in grade 10 subjects in selected Thohoyandou secondary schools".***

The purpose of this study is to collect information regarding teachers' views on the integration of environmental education themes in CAPS subjects at school. Five (n=5) secondary schools with the total number of twenty (n=20) teachers will be purposefully sampled to participate in this study. Participants are expected to respond to the face-face semi-structured interview questions, which will be followed by non-participatory observation, and end with documents analysis. For the purpose of gathering information, a tape recorder will be used to record the researcher and participant conversation, which will later be transcribed.

Participating in this study is voluntary and participants are under no obligation to consent to participation. Participants will be given the consent form to read and sign before participating. They are at liberty to can withdraw at any time and without giving a reason. There are no attached promises or benefits for the participants and participation in the study is voluntary. The researcher does not anticipate any harm or negative consequences for you as a participant in this study. However, if any unforeseen harm or negative consequences may take place, such, will be reported to the relevant stakeholders such as UNISA Ethics Committee and the circuits through a written report.

Participants names will not be recorded anywhere and no one will be able to connect participants to the answers you give. Answers will be given a code number or a pseudonym and participants will be referred to in this way in the data, any publications, or other research reporting methods such as conference proceedings. A report of the study may also be submitted for publication, but individual participants will not be identifiable in such a report.

Hard copies of participants' answers will be stored by the researcher for a period of five years in a locked cupboard/filing cabinet at the supervisor office for future research or academic purposes; electronic information will be stored on a password-protected computer. Future use of the stored data will be subject to further Research Ethics Review and approval if applicable. If necessary, hard

copies will be shredded and/or electronic copies will be permanently deleted from the hard drive of the computer through the use of a relevant software programme.

This study has received written approval from the Research Ethics Review Committee of the CEDU research ethics, Unisa. A copy of the approval letter can be obtained from the researcher if you so wish. If you would like to be informed of the final research findings, please contact Vhulahani Patrick Tshivhase at 082 785 1350 or email vhulahanipatrick@gmail.com. The findings are accessible for three years. Should you have concerns about the way in which the research has been conducted, you may contact Dr. AS Mawela at 0124294381 or email: mawelas@unisa.ac.za

Hoping that you find this in order.

Yours faithfully

Tshivhase V.P

.....
Signature

31. 05. 2018
.....
Date

APPENDIX H: REQUISITION LETTER (SCHOOLS)

P.O Box 2188
Thohoyandou
0950

The principal

……
……
…….

Dear Sir/Madam

APPLICATION: REQUEST FOR PERMISSION TO CONDUCT AN EDUCATIONAL RESEARCH

1. The above matters refer:
2. I am currently pursuing my master's degree through the University of South Africa in the field of education. I am hereby applying for permission to conduct a research study in your school.
3. This educational research will require four teacher participants from grade 10 implementing environmental education themes in CAPS subjects.
4. My research topic is Teachers' perceptions of environmental education integration in grade 10 subjects in selected Thohoyandou secondary schools**.**
5. Hoping that you find this in order.

Yours faithfully

Tshivhase V.P

……

APPENDIX I: APPROVAL LETTER (DISTRICT)

LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF
EDUCATION

VHEMBE DISTRICT

CONFIDENTIAL

REF: 14/7/R
ENG: MATIBE M.S
TEL: 015 962 1029

TSHIVHASE V.P
P.O BOX 2188
THOHOYANDOU
0950

REQUEST FOR PERMISSION TO CONDUCT AN EDUCATIONAL RESEARCH

1. The above matter refers.
2. This serves to inform you that your request for permission to conduct research on the topic: ***"Exploring teachers' views regarding the integration of Environmental Education themes in grade 10 CAPS subjects"*** has been granted.
3. You are expected to observe ethical considerations particularly those relating to confidentiality, anonymity and voluntary participation by research subjects.
4. Kindly inform the Mvudi circuit manager and the principals of selected Schools prior to your interactions with your research subjects.
5. Wishing you the best in your study.

DISTRICT DIRECTOR

2018-01-11
DATE

Thohoyandou Government Building, Old Parliament, Block D, Private Bag X2250, SIBASA, 0970
Tel: (015) 962 1313 or (015) 962 1331, Fax: (015) 962 6039 or (015) 962 2288

The heartland of southern Africa - development is about people!

REQUEST FOR PERMISSION TO CONDUCT AN EDUCATIONAL RESEARCH: TSHIVHASE V.P

APPENDIX J: APPROVAL LETTER (CIRCUIT)

LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF
EDUCATION

DZINDI CIRCUIT

Enq: Nemurarate H
Cell: 076 411 2582

TSHIVHASE VHULAHANI PATRICK
BOX 2188
THOHOYANDOU
0950

DEPARTMENT OF EDUCATION
DZINDI CIRCUIT OFFICE
06 JUN 2018
P.O. BOX 1406
LWAMONDO 0985
LIMPOPO PROVINCE

APPROVAL FOR PERMISSION TO CONDUCT AN EDUCATIONAL RESEARCH IN DZINDI CIRCUIT SCHOOLS.

1. The above matter refers.
2. Your letter dated 31 May 2018 requesting to conduct research in Dzindi Circuit.
3. You are hereby informed that your request for permission to conduct educational research on *"Teachers' perceptions of environmental education integration in grade 10 subjects in selected Thohoyandou secondary schools"* has been granted.
4. You are expected to adhere to research ethical considerations, particularly those relating to confidentiality, anonymity and informed consent your research subjects.
5. The research should not have any financial implications for the Department of Education.
6. The research should not anyhow disrupt the academic and the process of Examinations programs at the schools.
7. Yours in service.

TS Nkuna
CIRCUIT MANAGER (DZINDI)

06/06/2018
DATE