ENVIRONMENTAL EDUCATION IN COLLEGES OF EDUCATION IN GHANA: EXPERIENCES AND PERCEPTIONS OF ENVIRONMENTAL EDUCATORS

By

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ABSTRACT

In 2002, a Ghana Education Review Committee identified that lack of environmental literacy hinders sustainable development (GMoE, 2007) and the 2007 Educational Reforms recommended integration of environmental education (EE) into basic and secondary schools. Although sustainability appears in environmental and sometimes political discourses in Ghana, most citizens are still not environmentally conscious. Permanently tied and yet often not attended to with regards to EE, are teachers who are tasked to teach young learners to become environmentally educated and exhibit sustainable behaviour, yet, not much research has been done involving EE teachers. Using phenomenological research design, experiences and perceptions of EE teachers in Colleges of Education in Ghana were explored via interviews. Among others, findings showed that teachers' experiences influenced their practice. Also, when not involved in curriculum development processes, teachers found ways of teaching what they thought students should know. It is suggested that training of college teachers should explore their personal values, attitudes and behaviour towards the environment and EE, promote effective teaching practices and offer consistent continuous professional development that address same, because, it is what teachers think, informed by their experiences that ultimately shapes the kind of learning that young people get.

DEDICATION

To the memory of my parents Robert Amalitinga Atuguba and Janet Akawire Atuguba. To my husband Gordon and my children Janice, Tracy and Joachim. This work is also dedicated to my siblings Frank, Raymond, Millicent and Harold. I also dedicate this work to my in-laws Mr. Joshua Jagri and madam Comfort Ali, not forgetting King and Vera Jawol.

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ABBREVIATIONS

ADP	Accelerated Development Plan
CoE	Colleges of Education
CPD	Continuous Professional Development
EE	Environmental Education
EFD	Education for Sustainable Development
EPA	Environmental Protection Agency
ESD	Education for Sustainable Development
GMoE	Ghana Ministry of Education
IUCN	International Union for Conservation of Nature
NACD	National Association for Conservation Districts
NAEE	National Assessment for Environmental Education
NCTE	National Council for Tertiary Education
OECD	Organisation for Economic Co-operation and Development
SRID	Statistics Research and Information Directorate
TLMs	Teacher - Learner Materials
TAE	Traditional African Education
T-TEL	Transforming Teacher Education and Learning
UN	United Nations
UNEP	United Nations Environmental Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
WCED	World Commission on Environment and Development
WWF	Worldwide Fund for Nature
NCATE	National Council for Accreditation of Teacher Education

UNDP United Nations Development Programme

CHAPTER ONE

INTRODUCTION

Increasingly, there is rising need for building sustainable societies with environmental consciousness because an environmental crisis, is a human crisis. According to Dei (1994), this growing awareness stems from threats to the safety of the natural environment and resources. There have been several Earth summits, environmental movements, debates, conferences and environmental organisations all seeking to raise awareness and perhaps trigger an awakening of environmental consciousness to help in sustainable development and hopefully save the environment. In 2014, UNESCO held a world conference on Education for Sustainable Development (ESD) in Nagoya, Japan to review the achievements of the UN Decade for ESD and chart a path for a new global action programme. At that conference, His Imperial Highness, the crown prince of Japan, said:

> "On our earth today, along with economic growth and increasing populations, we are also witnessing the advancing change of climate, loss of biodiversity, depletion of natural resources, increases in poverty and other problems. For our children and theirs, we have three important tasks: protecting the Earth's environment, which is the wellspring for ensuring lives abundant with blessings, treasuring the Earth's limited resources, and achieving sustainable development" (UNESCO, 2014).

Threats to the environment permeates through continents, countries, regions, districts, villages, homes, individuals and everything between. It is as much of a world issue as it is a local issue. So, the task to protect and treasure the earth as well as make moves towards sustainable development is apt.

1:1 Background

On the 23rd of July 2014, the Modern Ghana News website reported an incident of black rain in the Akyem Ayirebi and Akyem Ofoase area located in the Eastern region of Ghana which sent panic among people living in that area and nearby communities. As it turned out, this was a

result of serious pollution which had caused a Sulphur related acid rain (Modern Ghana News, 2014). The evolving story on Ghana's environment shows evidence to support the claim that our natural environment may be heading towards peril. Many authors (Buamah, Petrusevski and Schippers, 2008; Hens and Boon, 1999; Nsiah-Gyaboah, 1994; Osei, 2006; Songsore and McGranahan 1993;Tamakloe, 2000; Tom-Dery, Dagben and Cobbina, 2012) have identified poaching, loss of biodiversity, illegal logging, destruction of natural habitats, illegal small scale and large scale mining, lack of forest governance, human settlements, water quality, industrial pollution and waste management as some of the key problems affecting environmental quality in Ghana.

Ghana's forest reserves which stood at 8 million hectares in the 1950s has now depleted to 1.8 million hectares and is still on a downward dive. The country has lost about 93 percent of its forest reserves in 68 years and its rich biodiversity is gradually being depleted at a rate of about 22,000 hectares (ha) per annum. Agricultural land availability has reduced from 1.56ha in 1970 to 0.74ha in 2000 in a country where agriculture contributes 54% of Ghana's GDP (Gross Domestic Product) and accounts for over 40% of export earnings while at the same time providing over 90% of the country's food needs. Currently, there is a decline in carbon dioxide (CO_2) sinks in forested and reforested land and any further depletion it is feared will offset the balance and cause the level of CO_2 to soar (SRID-Ghana, 2001; Tamakloe, 2000). At this given rate, Ghana faces a risk of continually losing large hectares of its forest each year and with it the export deficits that accompany it, as well as the environmental impact it will leave in its wake. But this danger is not limited to forests, many of Ghana's water bodies are polluted from domestic and industrial waste (Hens and Boon, 1999) as well as chemicals used in fishing and farming activities. There are reports of heavy pollution of water through the action of large and small-scale mining activities which introduce iron, manganese and arsenic up to levels

considered to be unsafe by WHO guidelines (Buamah, Petrusevski and Schippers, 2008; Serfor-Armah, Nyarko, Dampare and Adomako, 2006; Tom-Dery *et al*., 2012). The Ghana Water Company Limited (GWCL) and Environmental Protection Agency (EPA) has warned that Ghana may soon lose all its water bodies due to pollution and mining activities if nothing is done to alleviate the situation (EPA, 2017; Ghana News Agency, 2017). Pollution of water bodies have also led to the contamination of fresh vegetables produced in intensive urban and peri - urban smallholder agriculture within formal wastewater irrigation (Amoah, Drechsel, Abaidoo and Ntow, 2006). The relationship between water, land and vegetation albeit a complex scientific one is quite easy to follow in the sense that pollution or destruction of one affects the others; the loss of forests means the loss of plant and animal life, their habitats and other species associated with them, the land which houses both underground and surface water is also affected in the process. Pollution of water bodies will equally affect the flora and fauna in and around these aquatic habitats and other animals that depend on it and on each other. And when the interplay of humans in relation to these resources is factored in, the effect on society can well be envisaged.

Rapid expansion in urban and suburban areas, high concentration of human activity along the coast, poor domestic environmental management coupled with industrial pollution, has led to a decline in sanitary conditions leading to continues existence and spread of some air and water borne diseases (Attipoe, 1996; Songsore and McGranahan 1993). The current transitional state of waste management policy (especially dealing with collection and treatment of waste) has led to use of excavated pits, low- lying grounds, burning and moderately controlled tipping as ways of disposing waste. These practices induce environmental hazards such as dust dispersion, smoke, odour, plagues of insects and rodents (Boadi and Kuitunen, 2005; Oteng-Ababio, 2010). The cost of environmental degradation to Ghana's economy is estimated to be

within the range of 1-10% ($12 billion) of the country's annual GDP (UNEP, 2013). Aside these existing environmental issues, there are emerging global issues such as climate change as well as emerging local issues such as the recent discovery of oil and gas as well as lithium in Ghana and its environmental implications.

1:2 Statement of Problem

The world is faced with various problems and challenges in addressing environmental issues but when it comes to developing countries such as Ghana, addressing issues of environmental concern is further compounded by a multiplicity of challenges deeply rooted in poverty, economic instability and marginalization, issues of politics, policies and governance among others. These challenges notwithstanding, significant legislative and institutional reforms have taken place since the 1990's including the establishment of institutions for regulating the environment such as Ghana Environmental Protection Agency (EPA), Water Resources Commission, and Forestry Commission. Efforts of these institutions are often supported by environmental non-governmental organizations (NGO's) such as Green Ghana and The Nature and Development Foundation. Government has also partnered organisations and companies such as UNESCO and Zoomlion (a Ghanaian company working to improve sanitation in Ghana and parts of Africa) in such endeavours as concerns environmental protection. The latest intervention by government to help protect the environment has been 'Operation Vanguard' to help curb the menace of illegal mining activities and reinstitution of sanitary inspectors (Samasama) with some sanitation intervention measures like provision of toilets for household in deprived areas (Graphic online, 2017/2018) all in a bid to improve the environmental conditions in the country.

The Ghana Education Review Committee of 2002 identified environmental degradation as one of the key issues hindering sustainable development in Ghana and indicated that destructive

practices which adversely affects the environment often results from lack of environmental literacy and consciousness. This led to prioritising the integration of EE into basic and secondary schools in the 2007 educational reform (GMoE, 2007) and although sustainability appears in almost every environmental and sometimes political discourse in Ghana, the desired change of having citizens who are environmentally conscious, and exhibit environmentally friendly behaviour is yet to be achieved. Environmental Education (EE) is aimed at producing citizenry who are environmentally literate and capable of actively addressing environmental challenges and problems (Stapp, Bennett, Brayan, Futon, McGregor, Nowak, Swan, Wall and Havlic, 1969; 1980; Roth, 1992; Coyle, 2005). When people are aware of environmental issues and are well equipped with ways of dealing with these issues, then an avenue has been created to help address problems confronting the environment. "The more people with even elementary environmental literacy, the better will be the quality of environment" (Roth 1992, p.35). In 1944, renowned conservationist Aldo Leopold wrote; "Acts of conservation without the requisite desires and skill are futile. To create these desires and skills, and the community motive, is the task of education" (Coyle 2005, p ii). President Nixon of the United States of America stated in his august message to congress regarding the first report from the council on environmental quality in 1970; "We must seek nothing less than basic reform in the way our society looks at problems and makes decisions. Our educational system has a key role in bringing about this reform." (Richard Nixon, 1970, Section. 'Getting at the Roots'). It is an advantage in Ghana to use the mechanism of formal education to achieve environmental literacy and sustainable development because currently, basic school enrolment in Ghana is almost 123%. The over 100% enrolment is because of children who are past school going age but have been enrolled in governments attempt to provide education to all (World Bank, 2015).

Permanently tied and yet often not attended to with regards to the success of EE is the

teacher. Teachers play a vital role; they must be there to bring about the environmental awareness and action driven citizens that the world craves for. Year after year they encounter hundreds of pupils and impact their lives in one way or the other. They are tasked to groom young learners to become environmentally educated and by extension exhibit environmentally sustainable behaviour, yet in Ghanaian EE discourses, very little research has been done on teachers of EE. Environmental issues are defined by the way people perceive their impact on individuals, society, and natural systems (Yavetza, Goldman and Pe'erc, 2014), again, people's experience and their understanding of the environment, influences the resulting environmental behaviour they exhibit or are likely to exhibit (Loughland, Reid, and Petocz 2002; Palmer 1998) or pass on to others as education. EE should be contextual, based on the ways in which different people perceive and understand their environment and define their place in it (Wals, 1992). Therefore, such research on teachers' experiences related to EE is crucial to feed into the educational system for it to be effective and efficient. After all, teachers are the ones who teach the subject and their views and experiences of their practice of teaching this all-important subject is critical to policy makers, curriculum developers, researchers in this area and indeed all stake holders in education and it is important that their voice is heard. As Hargreaves (2000, p. xi) puts it, "It is what teachers think, what teachers believe, and what teachers do at the level of the classroom that ultimately shapes the kind of learning that young people get."

1:3 Purpose of the Study

According to Yero (2010), recent studies reaffirm that perhaps the most important factor that affects student learning is the quality of teaching. She however states that the definition of what quality teaching is has been focusing largely on observable behaviours over the years, and yet the unconscious ways in which teachers perceive the world and create their mental models of reality or their world views are highly individualistic. Experience of the environment vary, it is

very unlikely that any two individuals will have the same reality or world view, therefore, knowing individual realities gives a better understanding of a collective reality and a better appreciation of a situation. Yero (2010) states that, thought processes reside within the teacher and are therefore, not observable and so resist traditional experimental methods. She notes that individuals report their processes differently or subjectively unlike the measurable objective data which traditional methods of research are accustomed to. It is these subjective views of teachers which form part of their thought process and eventually affect their perception and practices which this research seeks to uncover. This research seeks to capture the "essences" (Sanders, 1982, p. 354) of the experiences and perceptions of EE teachers in CoE in Ghana. Investigating ways in which EE is understood, experienced, perceived and practiced by teachers is central for developing strategies that will help prepare teachers to better teach EE.

1:4 Research Questions

Two research questions guided this study;

1. What are teachers' perceptions of the environment and environmental education?
2. What are teachers' experiences of the environment and teaching?

The first question sought to draw from teachers, their perception and understanding of the environment and EE. The second question sought to find out teacher's experiences with the environment through their developmental years till date and their experiences with teaching EE.

1:5 Methodology

This study explored lived experiences and perceptions of environmental education tutors in Ghanaian CoE using a phenomenological research design. A purposeful sampling approach was used to select ten tutors from the five administrative zones into which all the 41 CoE are put. In this way, although not so important in this kind of research, all the Zones were represented. These tutors were interviewed using a semi-structured interview schedule which was self-

developed with document support from reviewed literature. Further details of the methodology and methods used in this research can be found in chapter six of this Thesis.

1:6 The Study Area and Context

This research was conducted in CoE in Ghana. Ghana is in West Africa with an estimated population of 28, 308, 301 (Ghana Statistical Services, 2016) with a total area of 238 540 km2. Ghana shares borders with Togo to the east, Côte d'Ivoire to the west, and Burkina Faso to the north. The south is bordered by the Gulf of Guinea and the Atlantic Ocean. Ghana is influenced by tropical humid climatic conditions and experiences two main seasons; rainy and dry season. The dry season is influenced by harmattan, a dry dusty wind that blows along the northwest coast of Africa. Three are six agro-ecological zones in Ghana which are Sudan Savannah, Guinea Savannah, Coastal Savannah, Forest or Savannah Transitional zone, Deciduous Forest zone and Rain Forest zone. The average minimum rainfall is 900mm/annum occurring around the South-eastern part of Ghana (Accra-Aflao) while the maximum rainfall is about 2000mm/annum, occurring in the southwestern portions (Axim). The rainfall pattern is uni-modal in the Coastal, Sudan and Guinea Savannah zones, but bi-modal in the three remaining zones. Temperature ranges across the country is between 21°C - 35°C (EPA,2017). But this varies across the country and dependant on the seasons and effects of climatic conditions. Ghana is also rich in biodiversity.

Although a multi-ethnic country, easy geographical and social mobility means that these ethnic groups have co-existed harmoniously and, in the process, have evolved similar cultural beliefs and practices. The regional variations therefore in terms of culture, beliefs and practices are not so pronounced and, in many instances, these are very similar and sometimes the same across ethnic and regional groupings in Ghana. For example, the recognition of 'bad days' where work is not done, be that farming, fishing or hunting is recognised in all cultures in

Ghana. Again, taboos (prohibitions) on eating certain species of animals is found in every ethnic group nationwide, although the sacred (or taboo) animal may differ. These are discussed in detail in Chapter three.

Presently, Ghana has 41 Colleges of Education (CoE) distributed throughout the 10 administrative regions in Ghana (See Figure 1.1). The 41 CoE are grouped into 5 administrative zones. These are: Greater Accra – Eastern; Northern; Central – Western; Volta and Ashanti – Brong – Ahafo. The research sampled participants from colleges in all five administrative zones (See Section 6:3:2:2 Sampling Procedure). The CoE are the sites for initial teacher training for Primary and Junior High School teachers. Like the first (Primary and Junior High School) and second (Senior High Schools) cycle schools, the CoE have a centralized curriculum designed by the Institute of Education, University of Cape Coast which is also responsible for conducting examinations and certification of qualified teachers.

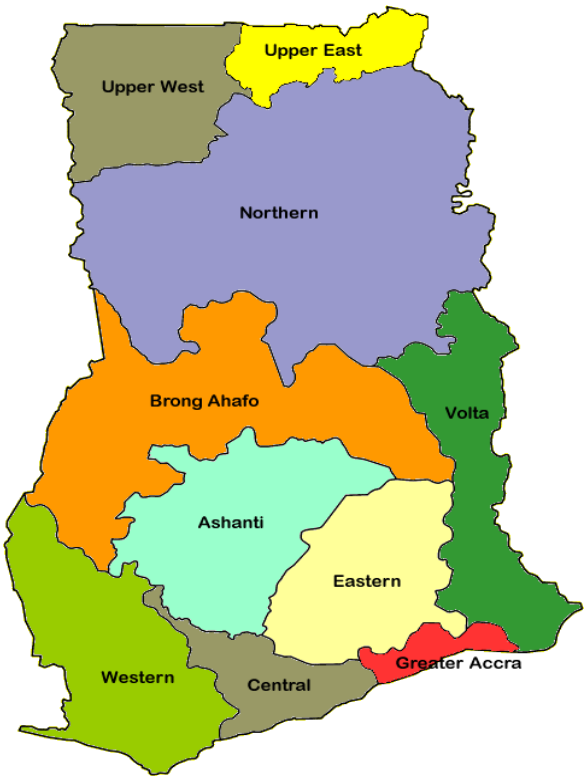


Figure 1.1 A Map showing the 10 Administrative Regions of Ghana

1:7 Positionality

Saturday was noted for two things, home and community general cleaning and during the farming season, farm work. Growing up, I learnt about the environment mostly from my parents. I heard stories about spirits and how they protected the land, water bodies and forests. Consequences of not adhering to environmental laws were preached from home, at school and in the community. There were sacred forests, some of which housed shrines and water bodies which we were not allowed to go into and or fetch water from at certain times of the day. I loved nature from what I saw and experienced, especially exploring the environment with friends. Throughout my education, these beliefs persisted although intermittently some were explained away by some of my teachers as outmoded. Throughout the early years of my education and during my childhood days at home, I receive much education on the environment in my view (don't litter, grow trees, we participated in communal labour, had gardens in school, planted trees and looked after them in our school compound, etc.) but this kind of education kept dwindling as I went up the educational ladder. This was later reinforced only at the postgraduate level where I read Public and Environmental Health Science.

I have taught environmental science / EE as part of the science curriculum for 15 years, 2 years in a basic school and 13 years in a college of education. Topics of the Biology course which excited students aside the Reproductive System, were lessons on the environment. Yet, evolving discourses in EE and local environmental issues were hardly touched in the curriculum and when they did, they were not detailed nor engaging enough for students. Also, with my years of expereince in teaching and knowledge gained in further studies, I have never been invited for curriculum development and other curricular related issues and for the most part we were stuck with the same curriculum.

On my research persuasion, I have previously held the view that if one can count, one can

then place a value on something and so it was easy appreciating quantitative research. In fact, both my first- and second-degrees research were quantitative in nature. However, I have over time and with experience realised the need of not just being able to make generalisations with numbers, but also to give attention to individual thoughts and voices. I have come to appreciate the famous saying attributed to physicist Albert Einstein 'Not everything that can be counted counts and not everything that counts can be counted' (Cullis,2017, p. 505). I have come to understand that even though numbers can give crowd and with it thunderous yelling and shouting which must not be ignored, the voices of lonely individuals who may not be chanting the same chorus as the crowd still matter, for they are still in all fairness, voices within the same crowd. As Neale Donald Walsch (Yero, 2010 p.7) puts it; "You may feel like a voice in the wilderness, but it is your voice we are waiting to hear. Yours is the crucial vote. You are the determining factor. We reach Critical Mass when we reach you…" But in listening and narrating the voices of others, it was important in this research to try and shield my voice as much as possible from interfering with the individual and collective voice of the participants. I needed to deal with my own biases on this subject of which I have been an active participant for many years, with a strong temptation of agreeing or disagreeing with what participants say almost immediately. And I have done so by stating my position both on the research subject and by using a methodology which allowed me to as much as possible quieten my voice and to hear the voice of the participants. This was also done during the interview stage and data explication process, where I, as much as possible, set my bias aside and dealt with the data on their own merit as the participants intended.

1:7 Outline of Chapters

This study has been organised into 10 chapters. Chapter One encompasses the background of the study, the statement of the research problem, the purpose of the study, research questions,

significance of the study, brief description of methodologies and methods used, the study area, my positionality and chapters into which the study has been organised. Chapter Two looks at Environmental education (EE) and includes a brief history of EE, the EE curriculum and brief history of Ghana's educational system, teacher training institutions in Ghana and EE in CoE. Chapter Three focuses on indigenous people and environmental protection in which traditional environmental beliefs and practices (TEBP) in Ghana are discussed in the light of what pertained in the past, the present-day condition of TEBP and what the future holds. In chapter four, environmental perceptions and teaching EE are discussed. It covers such issues as man and the environment, teaching EE, including pedagogies, CPD, teacher experiences and teaching EE, EE and the media and politics, as well as barriers to EE. Chapter Five is dedicated to discussion of the theoretical framewok which guided the research, Bourdieu's Social Practice Theory. Chapter Six details the methodology and methods of research and discusses the research paradigm, why a qualitative research was chosen, the research design with its philosophical assumptions. It also discussed the methods used in the research including how data was collected and worked with to come out with findings and how such processes were validated. Chapters Seven and Eight were dedicated to writing reports from the data explication process. Four main themes emanated from the data explication process and these were reported and supported with direct quotes from participants' narratives. Chapter nine discussed the findings reported. This was done in two phases, first the findings were operationalised within the theoretical framework of the study. The second aspect discussed the findings in the light of other research findings and literature. In both cases implications were drawn out. Chapter ten was the concluding chapter which summarised the entire research, recapped key findings of the study and their implications for practice. Suggestions were also made on areas to be considered for further research.

CHAPTER TWO

ENVIRONMENTAL EDUCATION (EE)

2:1 Brief History of Environmental Education

As far back as the 18th century, Jean-Jacques Rousseau emphasised the importance of an education that focuses on the environment. Lurie, (1960) reports that several decades later, Louis Agassiz, a Swiss-born naturalist, reiterated Rousseau's philosophy as he encouraged students to study nature and not books. It is believed that EE advanced from movements such as nature study, conservation and outdoor education (NACD, 1998).

The 1960s began with warnings of imminent environmental disasters. From Rachel Carson's Silent Spring (1962), the decade continued with widespread media coverage of environmental issues, publication of several books by ecologists, and the emergence of organisations such as Friends of the Earth to draw attention to the consistent mishandling of the environment (Stevenson, 2007). The term 'Environmental Education' according to Disinger and Roth (1992) was first encountered in 1948 at the meeting of the International Union for the Conservation of Nature and Natural Resources. Other authors (Gough, 1993; Palmer, 1998; Sterling and Cooper, 1992) recall the definition of EE in international deliberations towards the end of the 1960's. During this period Stapp *et al*., (1969, p.34) identified what was central to EE and they stated that; "Environmental education is aimed at producing a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware of how to help solve these problems, and motivated to work toward their solution". They noted that the major objectives of EE are to help individuals to; obtain a clear understanding that man is an inseparable part of an environmental system and that man can alter (and has indeed altered according to Lovelock, 2007) the interrelationships of this system; have a broad understanding of the biophysical environment , both natural and man-made, and its role in contemporary

society; have a fundamental understanding of the biophysical environmental problems confronting man, how these can be solved and the responsibility of citizens and governments to work towards their solution and also develop attitudes of concern for the biophysical environment which will motivate citizens to participate in biophysical environmental problem-solving (Stapp *et al*., 1969). According to Palmer (2002), perhaps the greatest attempt ever made in history to define EE was an International Union for the Conservation of Nature and United Nations Educational, Scientific and Cultural Organization (IUCN/UNESCO) international working meeting on EE in school curriculum which took place at Forester Institute, Carson City, Nevada, USA in 1970. He opines that it was at that meeting that a 'classic' definition of EE was formulated and adopted. The definition was given thus;

> "Environmental education is a process of recognising values and clarifying concept in order to develop skills and attitudes necessary to understand and appreciate the inter-relatedness among man, his culture and biophysical surroundings. Environmental education also entails practice in decision making and self-formulation of a code of behaviour about issues concerning environmental quality (IUCN, 1971, p.17).

Of note in this definition are all the essential components of the definition given by Stapp *et al*., (1969): the element of knowledge acquisition and or awareness of the environment and environmental problems; having the motivation, skill or know how to solve them; and the ethical consideration of behaving in an environmentally responsible way. In 1972, the United Nations (UN) Conference on the Human Environment held in Stockholm, Sweden, declared that EE must be used as a tool to address global environmental problems. Following this, UNESCO and United Nations Environment Program (UNEP) birthed three major declarations (The Stockholm Declaration in 1972, the Belgrade Charter in 1975 and the Tbilisi Declaration in 1977) that have further anchored and guided the progression of EE, as well as helped shape and open discourses on EE at international, national and local levels. The Stockholm Declaration was made up of seven proclamations and 26 principles to inspire and guide people

in safeguarding and improving the human environment and principle 19 pointed to the importance of EE (UNESCO, 1972). The Belgrade Charter, an outcome of the international workshop on EE held in Belgrade, Serbia (then, Yugoslavia), emanated from the Stockholm Declaration. It enhanced the previous declaration not just by adding objectives, goals and guiding principles of EE programs but also defined an audience for EE to include the public. The Tbilisi declaration (1977) particularly recognized the need to make environmental education an integral part of the entire education process and developed new goals, objectives and guiding principles on EE with considerations from both the Stockholm Declaration and the Belgrade Charter (Hungerford, Peyton and Wilke, 1980; UNESCO, 1980). The objectives of EE were as follows; awareness - to help social groups and individuals acquire an awareness and sensitivity to the total environment and its allied problems; knowledge - to help social groups and individuals gain a variety of experience in, and acquire a basic understanding of the environment and its associated problems; attitudes - to help social groups and individuals acquire a set of values and feelings of concern for the environment and motivation for actively participating in environmental improvement and protection; skills - to help social groups and individuals acquire skills for identifying and solving environmental problems and participation - to provide social groups and individuals with an opportunity to be actively involved at all levels in working toward resolution of environmental problems. Again, as with the definition of EE by IUCN, (1971), the objectives of EE in the Tbilisi Declaration report can be clearly identified in the definition of EE given by Stapp *et al*., (1969) and is geared towards the ultimate result that;

> "Environmental education, properly understood, should constitute a comprehensive lifelong education, one responsive to changes in a rapidly changing world. It should prepare the individual for life through an understanding of the major problems of the contemporary world, and the provision of skills and attributes needed to play a productive role towards improving life and protecting the environment with due regard given to ethical values. (UNESCO, 1997, p. 24)".

2:1:1 From Environmental Education to Education for Sustainable Development

According to Tilbury (1995), public environmental concern continued to heighten in the 1980's and the nature and scope of EE broadened. It was also around this time that the EE's holistic philosophy began to take root. By the 1990's EE had shifted focus and sought to also address education for sustainable development [ESD] (Fein, 1993; Orr, 1992; Sterling, 2001 Tilbury, 1995). This new agenda (sustainability) for EE was firmly embraced by the 1992 Earth Summit, which took place in Rio de Janeiro (Brazil). The summit called for the re-orientation of EE towards sustainability and emphasised the need to integrate the complementary disciplines of development education and EE which is critical for promoting sustainable development and improving the capacity of people to address issues of the environment and development (UNESCO, 1992). Agenda 21 was a significant achievement of this summit and offered a plan to address broader, more complex, ideas of sustainability including specific strategies and goals pertaining to education. Its recommendations included new ways to educate, care for natural resources and participate in designing a sustainable economy in the 21st century (WCED, 1993). At its launch in 2005, the United Nations Decade of ESD (2005-2014) provided a comprehensive outline for educational reform and stressed the role of experiential learning and the complex ethical and social context of schooling which embodied the holistic approach to EE and advocated for sustainability to be embedded in curriculum at all levels of education.

2:2 The Environmental Education Curriculum

UNESCO states that EE is vital in imparting an inherent respect for nature in societies and in enhancing public environmental awareness. It also stresses the role of EE in safeguarding future global developments of societal quality of life through environmental protection, eradication of poverty, minimization of inequalities and insurance of sustainable development

(UNESCO, 2014). Irrespective of the subject, Saylor and Alexander (1974), state that curriculum specialists have emphasised that goals are needed to provide a sense of direction for curriculum development and instruction. The goals and objectives of EE as earlier enumerated and explained under the Tbilisi declaration (1977) covers creation of awareness, imbuing knowledge, developing attitudes and skills and providing the opportunity for participation within the wider definition of EE and these must guide curriculum developers. It is also important to note that EE has crossover with multiple other disciplines including sociology, politics, ethics, public participation, and media and thus becomes quite a sophisticated concept. Indeed Gayford (1991), Goodson (2013) and Wheeler (1975) argue that the identity of EE has been problematic since its inception. According to Disinger and Roth (1992), the interdisciplinary nature of EE complicates it for educators. They explain for instance that many educators apparently assume that EE is the same as, or is a subset of, scientific literacy. Simmons (1989) gives reason for this as he explains that EE has not been infused equally within the curriculum and is seen and treated as part of or an add-on to a science course or program. Again, science educators have been involved with and show more interest in EE than educators in other subject areas (Disinger and Roth, 1992) and tend to believe that their discipline is the "vehicle for EE" (Lucas,1980, p. 1) and this has not helped the development of EE. Gough and Gough (n.d.) opine that this alteration from EE to ESD, has additional muddled the identity of environmental education and its placement or location within the curriculum".

2:2:1 Types of Curriculum that should inform Environmental Education

Eisner (1985) outlines three types of curricula which teachers teach knowingly or unknowingly. First is the Overt or Explicit curriculum which is purposefully written and taught. Then there is the Hidden or Implicit curriculum which is carried across to students by the behaviour, actions or inactions of teachers, the way they teach and the nature and structure of

the school and its routines. The third is the Null curriculum which is not taught or which the school neglects to teach. Cuban (1995), also identifies four types of curricula in use in schools. The official curriculum is what teachers are expected to teach and students are expected to learn, he explains that this type of curriculum is set out by the state or country which outlines all the courses which should be covered. The taught curriculum is what teachers choose to teach and their choices may be influenced by their knowledge of subject, and their likes or otherwise of topics, their experiences, attitudes of their students and so on. The third curriculum he identifies is the learned curriculum which is what teachers unknowingly teach students through for example, classroom management style of the teacher, how the teacher comports himself or herself or otherwise, teacher's style of teaching and even mannerisms and gestures. The fourth is the Tested curriculum which is what is tested based on the official curriculum and the success or otherwise of the student is usually dependent on this, as it is what was intended for students to learn. It seems therefore that the position, perception, actions and inactions of the teacher is central to what the student will learn whether it is actively taught or not and hence the move to make the teacher environmentally conscious cannot be underestimated. If a teacher is imbued with environmentally friendly behaviour, it becomes part of his or her nature and even if not taught overtly or officially, it will be learned implicitly by the students.

2:2:2 Holistic Approach to Environmental Education

According to Stevenson (2007, p.147) traditional school learning tends to be "atomistic and individual". When a subject is identified and treated as a single subject as is the case of traditional subjects like Science, Maths and English, it has its own space and time on the school timetable and treated and is as a discrete component of the curriculum (Jackson, 1992). But the guiding principle of EE curricula is the concept of its holistic approach. It is this approach in combining existing knowledge, perspectives and skills in new ways (to solve environmental

problems) that gives EE a unique educational dimension (Meadows, 1990; Sterling, 1990). According to (WWF, 1990 p. 1), EE cannot be claimed as a subject, rather it must be treated as a "whole" concept that requires inputs from all parts of the curriculum. Although UNESCO (1992) highlights the need for curricular on EE to have a holistic outlook and be integrated into all areas of learning, Littledyke (1997, p.643) is concerned that EE as a "cross-curricular theme without a clear subject status, may be squeezed out by the demands of the extensive knowledge-centred and assessment-driven content of core science and other subjects". The integrated approach to teaching EE which pertains in Ghana is also used in countries such as Nigeria (Adedayo and Olawepo, 1997), Jamaica (Ferguson, 2008), New Zealand (Flaws and Meredith, 2007), China (Hua, 2004) and Uganda (Palmer, Suggate, Bajd, Ho, Ofwono-Orecho, Stamden, 1998). The call for a holistic approach to EE by UNESCO and thus its integration into the entire school curriculum is also shared by some authors (Palmer, 2002; Palmer and Neal, 2003; Smyth, 2006). Yet Stokes, Edge and West (2001) argues that because the curriculum documents do not necessarily prescribe the content, there is flexibility in some countries in terms of the extent to which EE is covered. For Gruenewald (2004), the definition of EE is so general that it makes it possible for any practice that can be loosely connected with EE goals to be called EE, even if a little piece of the curriculum is dedicated to environmental learning. It is therefore not uncommon as Sobel (1996) notes to find isolated activities on environmental learning which is often very superficial with little attention given to environmental experiences of both teachers and students

2:2:3 Components of Environmental Education

According to leading environmental educators such as Stapp *et al*., (1969) and Hungerford (2009), the field of EE focuses on environmental problems and aims to find solutions. It is therefore imperative that an individual has knowledge of the environment to understand and

appreciate environmental problems (locally, nationally and globally), have the skill to be able to solve or help solve them and the will, concern, love and or feel of responsibility to act as such. To Hungerford, Peyton and Wilke (1980, p. 43) the overarching goal of EE should aim

> "... to aid citizens in becoming environmentally knowledgeable and above all, skilled and dedicated citizens who are willing to work, individually and collectively, towards achieving and or maintaining a dynamic equilibrium between quality of life and quality of the environment".

This again rehashes the definition of EE by Stapp *et al*., (1969) and is not markedly different from the collective objectives in the Tbilisi declaration of 1977 and the outcomes of the Earth summits. Indeed Stapp *et al*. (1969, p. 31) emphasises that, "citizens should realize that the responsibility for the solutions (to problems that confront the environment) belongs to them and to the governments which represent them" drafting in political and economic aspects of EE with the call of reaching citizens of all ages to play an effective role in solving environmental problems.

According to Stapp *et al*. (1969, p.31), components of EE should include a broad understanding of the biophysical environment, both natural and man-made, and its role in modern society and a clear understanding of the interrelationship that exist among these (cognitive knowledge). It should also address environmental problems confronting man and how these problems can be solved (psychomotor skill), as well as the responsibility of citizens and government to work toward solutions to environmental problems (ethical considerations). In addition, attitudes of concern for the quality of the biophysical environment which will motivate citizens to participate in biophysical environmental problem solving (affective domain) should also be addressed.

A meta-analysis of the behaviour research in EE by Hines, Hungerford and Tomera (1987) showed that certain factors must exist or be made available to an individual to elicit an environmentally responsible behaviour. They noted that among these are cognitive knowledge,

cognitive skills, and personality factors. They argued that before one can deliberately act on an environmental problem, one must be familiar with the problem and have knowledge of available actions that can be taken to address the problem and which of the actions will be most effective in each situation. Such an individual must also possess the skill to correctly applying this knowledge to solve the problem. Of great importance, they noted is one's desire to act, which they stated appears to be affected by a host of personality factors and situational factors, such as economic constraints, social pressures and opportunities to choose different actions. According to Hungerford and Volk (1990), the argument which suggests that increased knowledge leads to favourable attitudes which in turn churns out environmentally responsible behaviour as assented to by some authors (Borden and Schettino, 1979; Dispoto, 1977 a and b; Fortner and Teates, 1980; LaHart, 1978; Moore, 1981; Ramsey and Rickson, 1976; Stamm and Bowes, 1972) does not hold true in most situations. In fact, they argue that most research finding have been to the contrary. Referring to a publication by Hines, Hungerford and Tomera (1986-87) in which 128 studies were analysed on behaviour research, Hungerford and Volk believe that there are some variables that need to be addressed in EE to achieve environmentally responsible behaviour. They state that research by authors including (Borden and Powell 1983; Holt 1988; Ramsey and Hungerford, 1989; Simpson 1989) revealed that there are three categories of variables (entry-level variables, ownership variables, and empowerment variables) that contribute to behaviour. The variable categories they explained are theorised to act in a linear fashion as seen in figure 2.1, although the relationship between these variables is quite complex.

As explained by Hungerford and Volk, Entry-level variables are good predictors of responsible citizenship behaviour. These are variables which will at the very least enhance an individual's decision making. Environmental sensitivity (which can be related to the affective

domain) is the most important variable at the entry level and is defined as an empathetic outlook toward the environment. It is the one entry level variable that has shown a dramatic relationship to behaviour in research. (Sia, Hungerford and Tomera, 1986; Sivek, 1989).

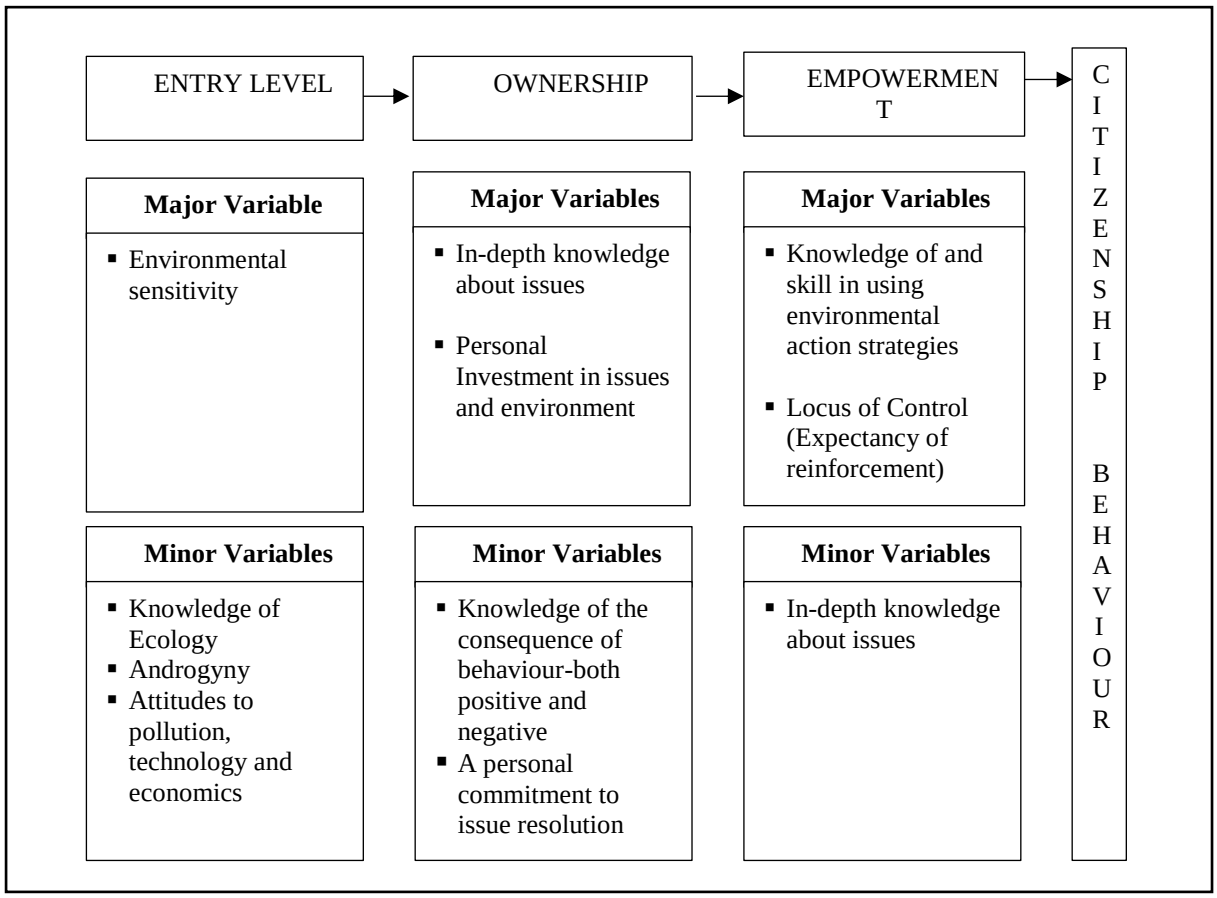


Figure: 2.1 Variables in Environmental Citizenship Behaviour by Hungerford and Volk, (1990)

The minor variables at this stage include androgyny which is often associated with great sensitivity, empathy, and self-confidence in helping resolve environmental issues, as well as environmental knowledge and attitudes. Although the attitude variable has been linked to environmental behaviour (Marcinkowski, 1989), Hungerford and Volk, argue that the extent of its involvement is still unknown and thus, they are shown as minor variables. The major ownership variables are in - depth environmental knowledge (cognitive domain) and personal investment variables that make environmental issues very personal. This is what Opotow and

Clayton (2003), refer to as environmental identity. These ownership variables are the most important and critical for the development of responsible behaviour (Holt, 1988; Klingler, 1980; Simpson, 1989). When individuals have an in-depth understanding of issues, they appear more inclined to take on citizenship responsibility toward those environmental issues. This position is also shared by Roth (1992, p.35), who argues that the "presence of environmental literacy no matter how basic will lead to a better quality of environment". The knowledge component and the personalised aspect of ownership variables which drives environmentally responsible behaviour, can be linked to Bourdieu's concept of Capital and Habitus (see section 5:1). They include resources acquired (including knowledge) and the physical embodiment of culture, deeply ingrained habits, skills, and dispositions that we possess due to our life experiences (which relates to the personalised aspect of the ownership variables) which inform our ability to act the way we do. Perhaps that is why some researchers (Alaimo and Doran 1980a; Edwards and Iozzi, 1983; Kohlenberg, Phillips, and Proctor 1976; Superka and Harmes 1977) have noted that it is extremely difficult to change environmental attitudes and values because considering Bourdieu's social practice theory, these have mostly been formed as part of the individual's habitus and thus will be difficult to change and in likewise manner, positive environmental attitudes and values once acquired may be long lasting (Iozzi, 1989b). Empowerment is a cornerstone of EE. Variables of empowerment create a sense that environmental action is important. Knowledge of and skills in using environmental action strategies create the motivation to behave in an environmentally responsible way (Hungerford and Volk, 1990). Hungerford and Volk (1990) explain that the empowerment variable (which identifies with the psychomotor domain) are decisive in the training of responsible citizens in the environmental dimension. These variables give human beings a sense that they can make changes and help resolve important environmental issues. These skills which they note are easy

to teach, help in developing self-confidence, improve students' self-concepts and belief of full incorporation into society, and are very strong considerations when making students more responsible citizens in their own communities. The relationship of environmental action strategies (empowerment) and environmental behaviour has also been noted by other researchers (Holt 1988; Klingler 1980; Simpson, 1989). Locus of control refers to an individual's belief in being reinforced for a certain behaviour and this again has a relation with Bourdieu's concepts of capital and habitus. A person with an internal locus of control expects that he or she will experience success or somehow be reinforced for doing something, success, in turn appears to strengthen his or her internal locus of control, whereas one with an external locus of control may feel such powers lie outside him or her and feels powerless to make such changes (Hungerford and Volk, 1990). They further indicate that the locus of control can be improved with teaching citizenship action skills which gives an opportunity to apply these skills successfully in the community.

2:2:4 Environmental Education 'in', 'about' and 'for' the Environment

In 1979, Arthur Lucas proposed a model for EE as being education 'in', 'about' and 'for' the environment which has been and is still used in EE discourses. He explained that education 'about' the environment, is concerned with providing cognitive understanding including the development of skills necessary to obtain this understanding, whilst Education 'for' the environment, should focus on environmental preservation or improvement. Education 'in' the environment he suggests should be characterised by a technique of instruction. The National Association for Environmental Education-NAEE- England (2016), has suggested that education 'about' the environment should include developing knowledge and understanding about the environment and should begin with an awareness of the local environment and then extend to an understanding of global environmental issues. Education 'in' the environment

should include using children's immediate surroundings and the wider world as a learning resource. This can be thought of as the 'hands-on' element, whereas education 'for' the environment should embrace the development of positive attitudes and behaviours towards the environment. They however indicate that education 'for' the environment can only be effective if education 'in' and 'about' the environment is in place (2015, p.5). From the above, education 'about' the environment is within the realm of knowledge acquisition (cognitive development), education 'in' the environment addresses skill development (psychomotor domain) while education 'for' the environment involves environmental sensitivity and encompasses the affective domain. It is therefore imperative to cover the cognitive, affective and psychomotor domains in any meaningful EE program.

Palmer, (1998) in his tree model for EE includes these three dimensions and recommends that all the components of the EE (Fig. 2.2) model should be addressed in a systematic way, they should be taught together with all the issues, action oriented and social education they encompass. He further explains that for development of EE it is necessary to use a dynamic model that considers individualities and personal experiences of students. This will seem to make sense because apart from considering the personal experiences that forms the individual's habitus which affects their behaviour, the individual and society is constantly evolving and the that window for change(s) that comes with these evolutions must be provided for. As Wals (2015) explains, the world is constantly and rapidly changing and what we think is sustainable today might not be sustainable tomorrow.

Aside the tree model, there are other environmental behaviour models such as the Onion model (Käpylä, 1995) which suggest that successful EE includes strategies for knowing, feeling, willing and, if possible, also for action. Knowing and knowledge as ideological power factors are at the core of the model and so are experiences. Responsible environmental

behaviour develops step by step through three phases: entry-level variables, ownership variables and affecting variables. There is also the House model (Jeronen and Kaikkonen, 2002) which puts emphasis on the development of environmental sensitivity.

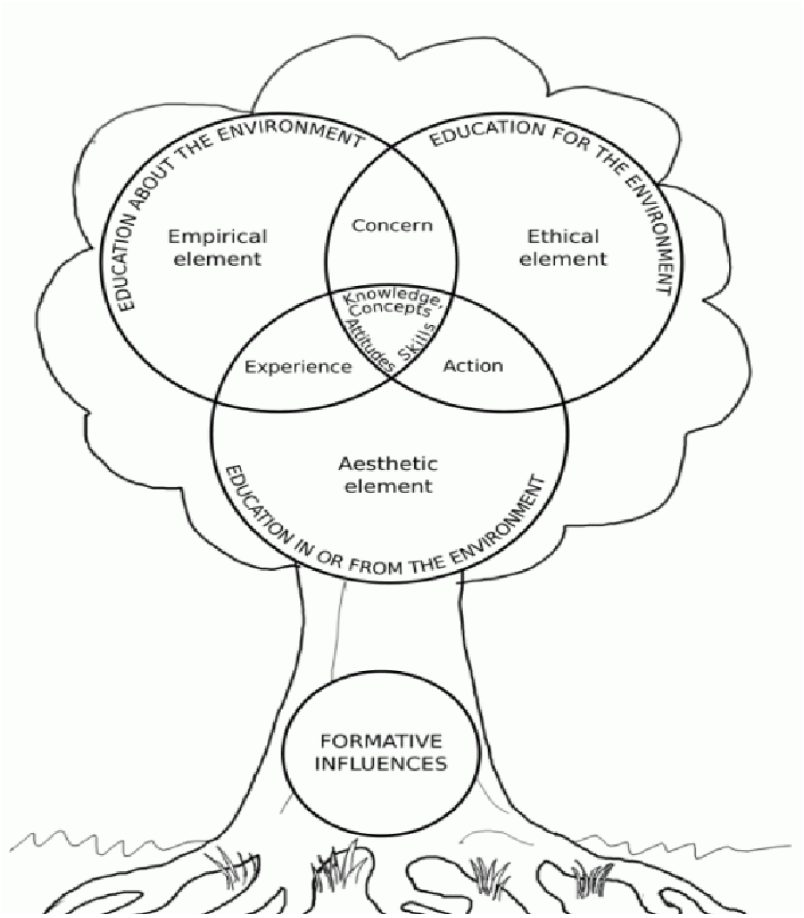


Figure 2.2: The Tree Model for Environmental Education (Palmer, 1998)

In this model, awareness and knowledge as well as the responsibility and readiness to solve environmental problems is considered important. It is worth noting that for each of these models, the cognitive, psychomotor and affective domains are accounted for and so their interrelation and importance in any attempt to environmentally educate cannot be overemphasized. For example, a study of pre-service teachers in Israel and Greece showed they had limited knowledge about the environment, and even though they had positive attitudes towards the environment, it resulted in less responsible environmental behaviour (Yavetz and

Goldman, 2014; Spiropoulou, Antonakaki, Kontaxaki and Bouras, 2007). In Nigeria, Ogunyemi and Ifegbesan (2011) having identified a positive disposition toward environmental issues among teacher trainees, also discovered evidence of a knowledge gap which could hinder environmental stewardship. The relationship between knowledge and action strategies (Hungerford and Volk, 1990) to bring about positive environmental behaviour is thus justified. If a person has knowledge and desire to act but lacks skill or action strategies, he or she cannot take the requisite action to address an environmental problem when confronted with one.

Hungerford and Volk (1990) noted that opportunities can be maximised to change behaviour when education agencies apply the following critical education component to EE. These components include: teach environmentally significant ecological concepts and the environmental interrelationships that exist within these concepts; provide carefully designed and in-depth opportunities for learners to achieve some level of environmental sensitivity that will promote a desire to behave in appropriate ways; provide a curriculum that will result in an in-depth knowledge of issues; provide a curriculum that will teach learners the skills of issue analysis and investigation as well as provide the time needed for the application of these skills and provide curriculum that teach learners the citizenship skills needed for issue remediation as well as the time needed for the application of these skills and provide an instructional setting that increases the learner's expectancy of reinforcement for acting in a responsible way and thus, developing an internal locus of control in learners or building an environmentally friendly habitus. Research shows that a person's level of education has a strong relation to positive environmental concern (Horvat, 1977) and that younger children who are well educated seem more concerned about the environment (Tognacci, Weigel, Wideen, and Vernon, 1972) and hence the call to start EE early in the child's life at the primary school level couldn't be more appropriate (Bryant and Hungerford, 1977; Miller, 1975). However, from the foregone, it is

important to plan the curriculum such that it addresses all the domains in complimentary percentages guided by these behaviour models in driving behaviour change through education.

2:3 A Brief History of Ghana's Education

Ghana's educational system has gone through several stages to the present formal education. It began with what was identified with the indigenous people now referred to as Traditional Education (be that African or Ghanaian). Then the arrival of merchants (Portuguese, Dutch, and later English, Danish, and Swedish) marked an era of a kind of education which was established purposely to educate their mulatto children merchants had with native Ghanaian women and to help in training assistants whom they needed to help in their trade and missionary work (Antwi, 1992; Graham, 2013; McWilliam and Kwamena-Poh, 1975). Then came the colonial era where Britain had full authority over the Gold Coast colony. By this time there were schools scattered due to the work of the missionaries and traders but the plan for education used was varied across the schools and this made government draw up its first plan in 1882 to guide the development of education. By 1933 important emphasis was placed on teacher training and educational expansion was cautious and limited by the supply of trained teachers (Akyeampong, Djangmah, Seidu and Hunt, 2007). The Accelerated Development Plan (ADP) for Education of 1951 proposed a massive expansion of provision for primary and middle school education. Under the ADP, Teacher Training Colleges were opened and 'pupil teachers' (untrained teachers) were trained while in service. The ADP introduced tuition fee-free primary education and undertook 'emergency' training of large groups of teachers (Little, 2010). By post-independence, in 1957, the Kwame Nkrumah government made basic education free and compulsory by the 1961 Act (Act 87). By the end of 1960, the Ghanaian educational system had six years of primary education which was then followed by 4 years of secondary education. Students upon successful completion entered a two-year sixth form course leading to university entry while unsuccessful

students continued two years of vocational classes (Addae-Mensah, Djangmah and Agbenyega, 1973). This system was however considered as being academically inclined and long and a series of reforms followed in the 1980's which culminated into the Junior Secondary School system (JSS) now Junior High School (JHS). This gave six years primary education and three years JHS education bringing basic education to a total of 9 years, which was to be free and compulsory. The JSS system had and perhaps still has issues. From large number of subjects ranging from 12-13 (World Bank, 1989) resulting in increased workload for teachers (Nyoagbe, 1993) to teachers not having the confidence and the mastery to handle many of the new subjects introduced in the curriculum (Little, 2010). Currently, the number of years for education in Ghana which starts at age six, is six years of primary school, three years of JHS, three years of senior high school (SHS) and four years of university education (6-3-3-4). Students who pass examination at the SHS level can go on to the university or pursue other courses at the polytechnics, colleges of education or other tertiary institutions such as nursing training colleges, institutes of journalism among others.

2:3:1 Teacher Training Institutions in Ghana

The pivotal role teacher education plays in the development of any nation is clear. Teacher education ensures that competent, committed, and dedicated teachers are produced to improve the quality of teaching and learning. As Adegoke, (2003, p. 5) notes "Education is a condition for development and the teacher is the ultimate definer of its reality". The importance of initial teacher education programs to support education for sustainable development has also been recognised by the UN (UNESCO, 2002a). The Colleges of Education (CoE) in Ghana are institutions devoted to the training of student-teachers to enable them to acquire the necessary professional and academic competencies for teaching in pre-tertiary institutions and non-formal education institutions (Government of Ghana, 2012).

According to the National Council for Tertiary Education (NCTE), Diploma in Basic Education (DBE) is offered in 38 CoE in Ghana, now 41 with 3 newly added colleges in 2017. The distribution of the colleges according to NCTE are as follows: two in Greater Accra; six in the Eastern region; seven in Volta region; seven in Ashanti region; five in Brong Ahafo region; three in Western region; three in Central region; four in Northern region; Two in upper West region; and two in Upper East region. This figure has been upped to 41as of 2017 with the absorption of three new CoE, one in Gambaga in the Northern region and another in Wenchi/Droboso in the Brong-Ahafo region. Apart from the CoE, the University of Cape Coast (UCC) and University of Education, Winneba, trains teachers for basic and pre-tertiary schools. Some graduates from other universities and tertiary institutions also enter the classroom as non-professional teachers (Institute of Education, UCC, 2014; Asare and Nti, 2014).

The programme offered in CoE is a three-year (six semesters) programme. Trainees spend part of this period on campus and part in the field (Out-Component). The 2007 Curriculum was broadened to include training of specialist teachers capable of teaching specific subjects such as Mathematics, Science, Technical Skills, French and Early Childhood Education. The Generalist trainees have the option to choose from one of the following content areas as their elective area of study; Music and Dance, Physical Education, Vocational Skills (either Sewing, Catering or Art related), Literature in English, Agricultural Science, Ghanaian Language and Culture and Religious and Moral Education. The programme employs the concurrent model of teacher training in which students get an individual subject training as well as pedagogy and a certain amount of practical activity credits at school (e.g. teaching practice). As compared to the consecutive model in which graduates that have a subject degree but have no teacher qualification get trained to teach (Sedereviciute-Paciauskiene and Vainoryte, 2015). The training therefore provides training in subject matter contents and pedagogy or professional

education simultaneously. Trainees are given contents up to level 200 at the University level to enable them further their education at the Post Diploma level if they choose to do so.

Assessment is both formative and summative. Internal continuous assessment constitutes 40% of trainees' final exam grade while external examinations constitutes 60%. Although the colleges run the program, the University of Cape Coast's Institute of Education (IoE) is responsible for examinations and certification (Asare and Nti, 2014; Institute of Education, UCC, 2014).

2:3:1:1 Environmental Education in Colleges of Education in Ghana

Students in CoE are expected to take at least seven foundation courses (FDC) including Mathematics, English, Ghanaian Language and Culture, Integrated Science, Social Studies, Pre-Vocational Skills and Religious and Moral Studies (Institute of Education, UCC, 2014). For the foundation courses, EE or environmental related topics are incorporated into Integrated Science 1, 2 and 3 (FDC 114, 124 and 224 respectively) and Social Studies (FDC 118, 128 and 218). An examination of these courses shows that, topics in Integrated Science 1 (FDC114) which are related to EE include; The Ecosystem (mainly on adaptation of organisms to their habitats) and threats to the environment (earthquakes, flooding and waste disposal). In Integrated Science 2 (FDC 124), topics that might relate to EE can be found in the topic Infectious Diseases where causes and prevention of diseases such as malaria and cholera may prompt discussions on sanitation. Integrated Science 3 (FDC 224) has a topic concerned with factors leading to depletion of soil which relates to EE.

For Social Studies courses, FDC 118 on Social and Human Land Issues has topics such as The Environment and Environmental Problems which includes meaning and types of environment, slums and natural disasters as well as air, land and water pollution. FDC 128 which looks at Ghana as a nation does not have related EE topics but FDC 218, which deals

with Socio-economic Development in Ghana has topics such as Challenges Facing Food Production in Ghana and Ways of Utilising Natural Resources which may lead to discussions in EE. However, according to the IoE (2014), students reading specialist subjects are exempted from some foundation subjects. For example, trainees pursuing Science and Mathematics programme are exempted from Social Studies and by implication, all the EE topics in Social Studies listed above. The only courses which have environmentally related topics for this set of students are FDC 124 (Biology 2) which has a topic on Health and Diseases and FDC 214B (Biology 3) which has a topic on Interactions in the Environment which deals with ecological factors and ecological equipment as well as adaptation of organisms to their environment. There is also a topic on Pollution and Degradation which involves practical demonstration of preventing soil erosion, as well as causes and prevention of water air and land pollution. They also offer Integrated Science 3 (FDC 224) earlier discussed in this section. Trainees offering the Technical Programme, do not take any courses in Integrated Science or Social Studies so no formal teaching and learning of EE is encountered by this set of students in CoE. Those offering the French programme take Social Studies courses in FDC 118, 128 and 218. Those offering Early Childhood Education take only one course in Social Studies which is FDC 118, but in addition to this they study ECE 213 on Social and Health Issues of the Young Child which has EE related topics like Ensuring a Healthy Environment for Children (importance of a healthy environment, environmental safety/ sanitation and involving parents and community in promoting a healthy environment). The topic on common diseases among pre-schoolers which looks at causes of some diseases may trigger teaching and learning as well as discussions related to EE. There is also a course on Environmental and Nature Study Activities for kindergarten which has a topic on keeping the environment clean. Juxtaposing this with the components of the EE curriculum and models for EE earlier discussed, there appears to be a

deficiency in rolling out Knowledge based, concern centred and action- driven EE for trainees in CoE in Ghana. But before the advent of formal education, how was the environment sustainably managed? What type of education ensured this and how was this kind of education given and passed on? How effective or otherwise was this type of education and what can we learn from it? This is what the next chapter captures.

CHAPTER THREE

INDIGENOUS GHANAINA PEOPLE AND ENVIRONMENTAL PROTECTION

This chapter begins by looking at a call to revisit indigenous knowledge systems as part of efforts for sustainability relating to the environment. Traditional African Education and living or way of knowing and how it relates to the environment and environmental protection through Traditional Environmental Beliefs and Practices (TEBP) is briefly discussed. The discussion narrows down to how the indigenous Ghanaian protected or protects the environment. Also discussed is the place of TEBP in current EE discourses.

3:1 A Call for Indigenous knowledge in Environmental Protection

Threats to the safety of the natural environment and its resources has led contemporary societies to an awakening and a re-trace to a way of knowing that has been considered primitive in time past and seemingly cast into the abyss of dark history. Indigenous knowledge relating to the environment has resurfaced as researchers (Adeyemi and Adiyinka, 2003; Avenorgbo, 2008; Awuah-Nyamekye, 2014; Battiste, 2002; Boaten, 1998; Gyampoh, Amisah, and Idinoba, 2009; Ogunniyi, 2007; Ngoufo,Yongyeh, Obioha, Bobo, Jimoh and Waltert, 2014) call for its revitalization and use in an attempt to provide solutions to the seemingly insurmountable environmental problems that currently plague the world and which contemporary knowledge has so far failed to address comprehensively. As Bean (1992) puts it, many native communities have long recognized the need for environmental sustainability, and present-day societies have much to learn from them.

3:2 Traditional African Education (TAE) in Brief

Traditional African Education (TAE) is the education of individuals that existed and still exist in some parts of Africa (including Ghana) prior to formal education. African knowledge systems including that of Ghana consist of diverse ways of knowing about our world and the

interrelationship between nature, culture and the environment (Adeyemi and Adeyinka, 2003; Battiste, 2002; Boateng, 1983; Busia 1967; Dei, 1994; Mbiti, 2015; Tedla, 1992). The basic principles that underlie most of the indigenous knowledge systems of people in Ghana generally emphasize a common humanity, group belongingness and a harmonious existence between people and the natural world. This way of knowing or kinds of knowledge systems are also found among the Yoruba of southwestern Nigeria (Bascom, 1969), Kung San of Botswana (Lee, 1979), Nuer of Sudan (Evans-Pritchard, 1940) and the Zanzibaris of Zanzibar (Madeweya, Hiroyasu and Mitsuo, 2004). In many traditional ways of knowing, a notion of unity exists according to which the natural, social and spiritual worlds are inseparable and integrated (Haverkort, 2009). Informal and vocational training constitute the core of indigenous education and under this system, each person in the community is practically trained and prepared for his or her role in society. It is a holistic system, in which storytelling, proverbs and myths play an important role (Adeyemi and Adiyinka, 2003; Boateng, 1983; Omolewa, 2007). The traditional culture of Ghana emphasizes a strong relationship with the environment and in the past albeit still practiced in few remote areas, traditional environmental beliefs and practices (TEBP) relating to land, forest and water bodies, formed part of the culture through which indigenous Ghanaians sustainably managed their environment (Boaten, 1998; Boateng, 1983; Danquah, 1968; Sarpong, 1974).

3:3 The Environment in the 'Eyes' of the Indigenous Ghanaian

In the Northern and southern parts of Ghana, a supreme God, considered male, is creator of all things and is worshipped by all people. The land is considered female and is the second most powerful god and referred to as Mother (Danquah, 1968; Dorm-Adzobu, Ampadu-Agyei and Veit, 1991). The Ga people of Greater Accra region however believe in a supreme being who possesses both masculine and feminine qualities known as *Ataa-Naa Nyonmo* meaning God

(*Nyonmo)* who is both He, (*Ataa)* and she, (*Naa*) (Osabu-Kle, 2010). It is believed that she [the earth] gives and sustains life, has spiritual power and the power of fertility and that it is her spirit that makes plants grow and as such she must be reverenced and respected (Boaten, 1998; Sarpong, 1974). The personalization of the supreme being as male, masculine entity or Father and the earth as Mother emphasized the close bond that existed between them as 'parents' and their 'children' who are the inhabitants of the Earth. It also implied the benevolent role of the 'parents' for their 'children' and the love and respect that must exist in such a relationship.

In Ghanaian culture and traditional education, individuals and communities are in communion with their ancestors and are responsible for protecting the environment which houses the spirits of these ancestors to whom the living are accountable. Thus, individuals, families and communities are mandated to manage the environment sustainably with the belief that they would have to account for their stewardship to the spirits of their forefathers or ancestors (Boaten, 1998; Danquah, 1968; Sarpong, 1974). Based on this way of knowing, the indigenous Ghanaian put in place cultural practices and taboos which although evolved with time, had the underpinning philosophy of environmental sustainability. This formed part of the informal institutions which governed individual and community behaviour before the advent of juridical laws. Apart from the fear, which these taboos instilled in people due to their link with the unknown especially with the dead and the spiritual ancestral world, there were also physical sanctions attached to not adhering to these beliefs and practices. The charge as well as the disgrace and consequences it brought (or brings) to one's self, family, clan, friends, neighbours and in some cases the whole community was deterrent enough (Sarpong, 1974).

3.4 Traditional Environmental Beliefs and Practices (TEBP) in Ghana-Then, Now and the Future

Some of these TEBP discussed below are taken from different communities in Ghana. In

doing this, I am mindful of problems that arise when one oversimplifies the traditions of many ethnic communities as pertains in Ghana, but the TEBP exemplified have a wide generality and although Ghana is multi- ethnic, the various ethnic groups have lived together harmoniously because their cultural practices often stem from the same beliefs.

3:4:1 Belief and Practices that Protected Land and Water bodies

Sacred forests in Ghana and some parts of the world are conserved primarily for spiritual reasons, they are of varying sizes and may range from a few square meters to several hecteres (Nganso, Kyerematen and Obeng-Ofori, 2012; Chandrakanth, Bhat and Accavva, 2004; Gadgil and Vartak, 1976). These forests are often associated with or believed to house a god or gods, and are sometimes named after deities (Chandrakanth, Bhat and Accavva, 2004). Any alteration of the forest like cutting wood, hunting, picking fruits or any other resource extraction is prohibited (Barre, Grant and Draper, 2009; Gadgil and Vartak, 1976) except during festivals and occasions when rituals are to be performed in some scared groves. During these occasions, some hunting and collecting of forest resources such as wood and fruits may be allowed (Dorm-Adzobu, Ampadu-Agyei, and Veit, 1991). According to Chandrakanth *et al*. (2004, p. 105), resource extraction from a sacred forest in India was perceived as a serious offence and "traditional people believed that the punishment for such crimes would be to be reborn as urchins for thousands of years". There are also reports of people who defied these prohibitions and fell ill, went insane or died (Chandrakanth *et al*., 2004; Dorm-Adzobu, Ampadu-Agyei, and Veit, 1991; Ormsby, 2012). Existing literature indicate that these groves existed over the years because of taboos and other traditional religious practices associated with them (Corbin, 2008; Dorm-Adzobu, Ampadu-Agyei, Veit, 1991; Nganso, Kyerematen and Obeng-Ofori 2012; Ormsby, 2012). In Ghana, some trees such as the African mahogany were regarded as gods and could not be felled without rituals performed (Abbiw 1990; Boaten, 1998; Falconer 1992).

Other economic trees such as ‘dawadawa’ shea, palm, black berries, tamarind, and baobab are also protected. There are days of rest during which the spirit of the earth should be allowed to rest. Such days are regarded as “bad days” (Boaten, 1998) for any fishing, hunting, farming activity or fetching water from water bodies and these days vary from community to community (Boaten and Nana, 1990; Dorm-Adzobu, Ampadu-Agyei and Veit, 1991; Opoku -Agyemang, 1995). For example, Boaten and Nana (1990) recall that farmers are enjoined to leave a strip of land of about 30 meters which should not be cleared at both sides of streams and rivers.

It is common knowledge that along the coastal regions of Ghana for example, fishermen are not allowed to fish on Tuesdays and farming is also prohibited on certain days in parts of Ghana.

3:4:2 Food, but don’t Eat!

There are taboos relating to eating certain foods in Ghana and this varies from community to community. Gadegbeku, Wayo, Ackah – Badu, et al. (2013) records snails not eaten by Ga men (Who hail from Greater Accra region of Ghana) and some Ewes (who hail from the Volta region of Ghana). Again, many clans in Ghana have a wild animal or plant species as their totem and traditionally such species are strictly protected. For example, the Buabeng-Fiema monkey sanctuary in Ghana, protects and supports black and white African Colobus and Lowe's Mona monkeys which are sacred to the local people (Ntiamoa-Baidu, Gyamfi-Fenteng, Abbiw 1992; Fargey, 1992). The Nafieba clan of Kokombas in Northern Ghana have a whale as their totem, while the alligator is a totem for the Nakam people of Nabago in the Upper East region. According to Osei (2006), taboos on eating totem animals including hedgehogs, tortoise, parrots, eagles and some species of fish ensured the non- extinction of such species.

3:4:3 Communal Labour, Call it Community Service

Communal labour was and still is (in some communities) an institutionalized practice where individuals undertook activities such as cleaning markets, hospitals, graveyards, building

schools, clearing foot paths, planting trees and so on. In doing so individuals were reminded constantly of the fact that they were part of the community and care of the environment is a shared responsibility. Today in Ghana, state authority is vested in political leadership which does not wield the kind of influence and authority the chiefs exercised over their subjects (Akordor, 2013) in carrying out such activities.

The discussion above is not to give the impression that all indigenous practices and taboos are perfect, and that formal education is without value to Ghanaians. There are taboos and practices that seriously affected the health of individuals and in some cases were fatal, among which were children not eating meat, female genital mutilation and practices such as Trokosi, where virgins are sent to serve in shrines as atonements for the sins of their relatives found guilty of rape, theft or murder (Gadegbeku *et al*., 2013; Osei, 2006). With the help of formal education, some of these taboos have been abolished to a wide extent, but it came at a price.

3:5 A New Way of 'Knowing'

The advent of Christianity, Islam, Western civilization and its accompanying technology in Ghana has relegated indigenous knowledge, beliefs, taboos, customs and traditions to the background. According to Acheampong (2010) these beliefs and customs are now regarded by many as fetish and useless, although they played and still play (in some remote areas) a key role in environmental protection. Since African Traditional Religion (ATR) is not considered one of the major religions, the taboos associated with it are unfortunately discarded as savage (Osei, 2006). According to Mazrui (1980), some of the early anthropologists to Africa such as Levy Bruhl, author of *Primitive Mentality* failed to understand the moral epistemology of the traditional people in allowing such practices and wrongly interpreted them as evidence of their ignorance. From such mistaken premises, Mazrui explains that an unfortunate conclusion was drawn which paved way for the Euro-centric projection and subsequent humiliation of African

knowledge systems as the 'other'. Lumping up these taboos and practices and condemning them as it were, without carefully studying their epistemological foundation or basis as it pertained to various ethnicities and what they sought to achieve by these taboos and practices, brought devastating consequences on the environment, a situation that persist among Ghanaians today. Culture allows creation of ideologies, rules and practices that allow people to make sense of the world in both different and shared ways (Crewe and Harrison, 2003) and so in some respects, the Ghanaian culture was destroyed, the focal point on which the Ghanaian culture is hinged was broken by the introduction of 'other' culture and there had to be [and indeed there was] a reconstruction of ideologies, rules and practices that would allow the Ghanaian to make sense of this new world. The combined forces of notably Christian and later Islam and western education unleashed an unprecedented assault on the environment. Formerly, taboos and traditional cultural practices were enough to control people's attitudes towards the environment but that is fast fading and has faded in some communities. The quest for a technological age and advancement spiced with modernity puts pressure on societies still trying to preserve their traditions. Alley (2003) and Taringa (2006) argue that cultural and religious practices are not necessarily ecological relationships with nature and do not always preserve the environment. Although this may hold true in sections of some cultures in some countries, other researchers (Anoliefo, Isikhuemhen and Ochije, 2003; Colding and Folke, 1997; De Merode and Cowlishaw, 2006; Kellert, Black, Rush and Bath, 1996) have found that informal institutions including traditional practices, cultural taboos and their sanctions have helped to check abuse of the environment at least among local people and they have insisted that maintaining these cultural practices and taboos protect the environment.

3:6 Knowing the Fear of the Unknown

The call for a return to indigenous knowledge or even a combination in whatever proportions

between western, scientific and indigenous knowledge to help address environmental challenges is understandable. But the 'fear factor' that characterized these practices are eroding and, in some cases, have completely eroded and it is this 'fear of the unknown' that contributed to the success of the taboos that protected the environment. The question then is; can one, having known that the fear of the unknown is not to be feared, still fear it? In Indonesia, a construction of a pipeline was opposed by the locals because they feared that the desecration of *Mata Loko* (sacred land) would provoke the ancestors, inviting widespread disease and death. Other local Protestants supported the pipeline construction because they said they no longer feared the wrath of the Marapu forest spirits (Fowler, 2006). This could have resulted from their faith and or beliefs, for if one believes that one is reunited with one's maker after death (as some Christian and Muslim faiths preach), how does a person of such faith believe that spirits inhabit the forests let alone respect their sanctity, resting days or any such taboos associated with such beliefs? Note that Christianity and Islam are practiced by 88% of the Ghanaian population according to the 2010 population and housing census (Ghana Statistical Service, 2012). The acceptance of such religious faiths in Ghana, has not only completely displaced the potency of ancestral spirits and the belief and practices associated with them, but has also eroded and continue to erode practices that protect the environment.

3:7 The Way Forward

From the foregone, it is worth noting the argument of Dikirr (2005) that in today's Africa (and Ghana for that matter), a discourse that is wholly established on the people's past tradition on spirituality and closeness to the land will be of little value. Western formal education has given 'scientific' explanations to many of these taboos and cultural practices and so the mysteries of life enshrined in cultural practices that protected the environment have been demystified. Having stated the difficulty involved in having to 'go back' and reinstitute taboos

and some cultural practices that governed the environment, the Ghanaian education system needs to drift from imbibing everything 'western formal' and trying to eschew everything 'indigenous or traditional'. We need to avoid a situation where a dominant system determines the rules of education in Ghana because knowledge entails that of traditional knowledge systems as well. Recognizing these 'other ways of knowing' leads to reconsideration of many fundamental notions about development, environmental conservation, heritage protection, and access to information and education (Boven and Morohashi, 2002). Mainstream knowledge space in institutions for education, research and development, is principally dominated by western science, its values and epistemic frame. This impoverishes not only the knowledge sector but also the development programs, because they are based on one dominant knowledge system (Haverkort, 2009). Maybe if indigenous knowledge is considered as 'a way of knowing' instead of 'the other way of knowing' that needs to give way to 'the way of knowing', it would present a chance of developing education in tune with a way of knowing which is familiar and more meaningful to a people. As was pointed out earlier, traditional education was not only there to be learnt, but also there to be lived. The practical aspect of education is not the one in which the child is able to only write what can be done, but one in which the child can adequately demonstrate or apply it, especially in EE. This equips individuals to be able to live in an environmentally sustainable way. Research shows that people are naturally good at remembering stories and respond better to emotion and belief than simple facts (Anderson 2001; Pooley and O'Connor 2000). Sharing stories that make use of overlaps with indigenous knowledge systems may therefore be a valuable approach in conservation education and wider conservation communication (Patel, 2006). The concept of responsible behaviour which connects or relates humans to the environment must reflect in our education for if people have no connection or relationship with the environment, they will not appreciate its protection even

if they are taught to do so. Acheampong (2010) suggests more pragmatic policies that will integrate traditions and customs that promote environmental sustainability. Maybe a look at endogenous knowledge suggested by Haverkort (2009) which integrates traditional as well as outside knowledge and practices involving communities and their world views may come in handy as well. Perhaps, there ought to be an interplay in considerate proportions of various knowledge systems of communities with formal knowledge systems, in developing future curricula for EE in Ghana, having in mind that despite its prominence, wide acceptance and use, scientific and western formal knowledge are just two ways of knowing among many.

CHAPTER FOUR

ENVIRONMENTAL PERCEPTION AND TEACHING ENVIRONMENTAL EDUCATION

4:1 Humans and the Environment

The principal feature of the philosophy of EE is that humans are an integral part of an environmental system from which he cannot be extricated. According to Stapp et al, 1960, the environmental system consists of three components; humans, culture, and the biophysical environment (both manmade and natural). Culture incorporates organizational strategies, technological processes, and social arrangements (which include educational, legal, political, managerial, etc.), through which humans interacts with the biophysical environment (Stapp *et al*., 1969). The interaction between humans and the environment has been the centre of debates in environmental discourses. Part of the argument has been that the existing human society does not have a co-operative relationship with nature (Steffen, et al, 2011). In his book, *The Revenge of Gaia*, Lovelock (2007) explains that humans have exploited the planet without counting the cost for thousands of years and the living Earth (Gaia) is now fighting back and humans will have to sustainably retreat. While debates on how humans have exploited the environment have gone on and are ongoing, there has been the emergence of yet another debate on the environment; the Anthropocene debate, which is not entirely different from earlier debates on humans and the effect of their relationship with the environment. According to proponents of this theory, the Anthropocene period or Epoch denotes the current geological age viewed as the period during which human activity has been the dominant influence on climate and the environment (Lowe and walker, 2014; Steffen *et al*., 2011). An anthropocentric worldview assumes that the exploitation of the planet's natural resources is reaching or has already "reached tipping point such that the prospects of the continuity of human life are to be questioned" (Chernilo, 2017, p.2). If humans continue to invade the environment without regard

for other environmental players (flora and fauna), it will lead to a catastrophic end for the environment, humans included. Whether we need to sustainably retreat or agree that we are in an Anthropocene era, there is genuine concern that something must be done to improve the relationship between humans and the environment so that humans, other living things and the environment can continue to survive.

4:1:1 Conceptualisation of the Environment

The concept of the environment may be understood differently by each one of us probably depending on how we have each experienced and or relate to it, or rather, that our perception of the environment determines how we relate to it. "No two persons see the same reality. No two social groups make precisely the same evaluation of the environment" *(*Tuan, 1990, p.5). Opotow and Clayton (2003, p.2) state that environmental identity which basically is how we orient ourselves to the natural world, can be used to explain how environmental issues become immediate and personal for an individual. They refer to two graffiti exchanges they had encountered. The first statement read "Eat organic – no poison food. Love Earth-don't poison your home". A second statement in response to the first read "Eat shit you tree hugging faggot". They noted that the 2nd statement reveals the individual's hostility to such positions taken by the first person (Opotow and Clayton, 2003, p.1), whose statement show an emotional attachment, a connection, concern, love, kind attitude and ethical responsibility towards the environment. The reason for these extreme stands on the environment is not exactly clear but should be of concern as to how two individuals faced with perhaps same environmental issues take such extreme opposing stands. It is worth noting however, that when there is no relationship between humans and the environment and a sense of responsibility towards the environment, such 'hash stance' can and are indeed taken. Drawing on traditional environmental beliefs and practices (TEBP) in Ghana (see chapter 3), one can begin to

understand why indigenous people for example referred to the earth as Mother because it instantly puts in perspective a relationship of reciprocal care, respect and a response of love. Even if these cultures are eroding and the world is turning to formal and scientific knowledge, the 'scientific benevolence' of the environment which should charge each person to respond in protecting the environment can still be taught.

4:1:1:1 The Environment as a Resource

In a research carried out by Moseley, Desjean-Perrotta and Utley (2010) in the USA to explore pre-service teachers' mental models of the environment, 60% of pre-service teachers did not include humans as a factor in the environment, much less incorporate human relationship with other factors. Only 5% indicated an approach with humans interacting with other environmental factors. The study concluded that for pre-service teachers, the word Environment produced mental images that did not depict naturalistic images of the environment. This is not so different from a finding made by Kimaryo (2011) in a study in Tanzania on Teachers' Perceptions and Teaching Practices in Environmental Education. In that research, she reports that none of the teachers in her initial interview, mentioned man as part of the environment. This gives credence to a report by Loubser (1992) which stated that humans do not consider themselves to be part of the environment but see themselves as superior to and in control of the other constituents of the environment. The latter part of this statement is also recorded by Kimaryo, in which she quotes one of the participants as saying after further probing "…Yes, man is part of the environment. I think so because man uses the environment…" Kimaryo (2011, p.86). This perception of humans being in control of and using environmental resources, sets humans aside from the environment and sees every other resource as 'usable' or as a reservoir waiting to be used by humans as and when he deems it necessary or useful. In this sense and according to Dietz, Fitzgerald and Shwom (2005), humans and their needs are

prioritised while nature is seen to be of a utilitarian or serviceable value. Technology which enables humans to get what he wants from what is available to him is very much at the centre of this 'superiority stance' adopted by humans in relation to the environment.

4:1:1:2 Humans and Technology

Technology has existed with humans from the time humans came to be and has evolve with time. As time changes, the needs of humans change or as humans change or evolves, their needs change with time and even today technology pervades almost every space and activity of humans, and humans with this trait of evolving needs, 'tune' natural resources and the environment into what they want without considering the consequence of such actions most of the time. For example, the economic value of gold found in most Ghanaian rivers has led to the exploitation of the environment without considering the flora and fauna that derive life from these rivers nor the 'life' these rivers 'breath' into the environment. Heidegger, one of the philosophers of the twentieth century in his ideas on technology cautions, that if humans view nature as a reservoir and continually use the earth's resources with careless abandon, there is the likelihood that humans in time will become a reserve waiting to be used and this he opines will lead to the loss of humanity (Heidegger and Lovitt, 1977). In search for ways to overcome technology, Heidegger views man not as lord of beings, but as "shepherd of Beings" and a custodian (Fernando 2003, p.96), a position held by indigenous Ghanaians (see section 3:3). According to Fernando (2003, p.97), "Man is primordially homo Ethicus before becoming homo Technologicus". It therefore follows that ethical dimensions must be considered in developing environmentally responsible behaviour.

4:2 Teaching Environmental Education

Some authors (Ham and Sewing, 1988; Kunz, 1990; Van Koevering and Sell, 1983) indicate that teachers generally think EE is important. It is the charge of education to imbue in children

all that it takes to realise that they are part of the environment and intrinsically woven within such that destruction of the environment will inevitably destroy humans. Teachers are invaluable in education; they are at the heart of any transformational agenda which must occur through education and EE is not an exception. They must therefore be equipped with knowledge and appropriate pedagogy for teaching and must be assisted to have an 'environmentally responsible life' or at least outlook to make teaching meaningful and transformational for the multitudes of students they encounter year after year.

4:2:1 Environmental Literacy among Teachers

A study by Yavetza, Goldman and Pe'erc (2014) in Israel indicated that pre-service teachers, did not demonstrate an adequate understanding of the concept environment. Whereas in India, Larijani (2010) reported that majority of primary school teachers had moderate environmental awareness, Teksoz, Sahin and Ertepinar (2010) in their study of Science teachers indicated that although teachers had favourable attitudes toward the environment and feelings of personal responsibility to create a better environment, they lacked a sound understanding of environmental issues. In Malaysia, a survey of the environmental knowledge, attitude and practices of pre-service secondary teachers indicated the need for more concerted effort in teacher education to prepare them for their role in educating 'for' and 'about' the environment (Esa, 2010). Kimaryo (2011) made similar finding in Tanzania and indicated that teachers were not well-trained in the teaching of EE in schools. Among pre-service teachers in Nigeria, Ogunyemi and Ifegbesan (2011) found that although a positive disposition toward environmental issues was demonstrated, there was evidence of knowledge gap which could hinder environmental stewardship. If teachers are not environmentally literate, they cannot effectively educate students on the environment. Tuncer, *et al.,* (2009) state that environmental literacy in students will be achieved when the teachers themselves possess good knowledge

about the environment. It is therefore important to have the knowledge (and skill) to teach in order to avoid the risk of misguided teaching.

4:2:2 Pedagogies

Pedagogy concerns itself with the theory and practice of teaching. It envelops the "interactions between teachers, students, the learning environment and learning tasks." (Murphy, Hall and Soler, 2008, P.35). McDonald and Dominguez (2010) state that, there is need for appropriate pedagogies to deliver effective EE in schools. As can be deduced, learning is heavily dependent on the pedagogical approach's teachers use in the classroom. Pedagogies are mainly grouped into teacher- centred approach and learner-centred approach including all that is between these two extremes. And although there may be a variety of teaching strategies that can be used, curriculum provision, program goals or objectives, topic to be taught, time availability, age of the child, learning objectives, 'academic ability' of the child, suitability of environment, availability of teaching and learning aids and a host of others, makes some pedagogical strategies more appropriate and effective than others. Thus, the effectiveness of pedagogy aside the content to be taught, will depend on the teacher's understanding of all the above listed and how he or she can plan and deliver effective lessons within a setting and this calls for pedagogical content knowledge.

4:2:2:1 Pedagogical Content Knowledge

Research has shown that understanding of both pedagogical and substantive content knowledge is pivotal to quality teaching and learning (Hattie, 2009). According to Cochran, (1997), pedagogical content knowledge is a type of knowledge that is unique to teachers and is based on the way teachers relate their pedagogical knowledge (which is what they know about teaching) to their subject matter knowledge (which is what they know about what they teach). In other words, using appropriate methods to transform the subject matter for instruction

(Thornton, Langrall, and Jones 1997) and understanding. According to Gudmundsdottir (1987), it is pedagogical content knowledge that makes teachers, teachers and not just subject specialists. This is because having subject matter knowledge does not necessarily translate to being able to effectively teach to bring about understanding and action. But that is not to say subject or content knowledge is of any less importance, a teacher needs to have the requisite knowledge in their area of speciality as earlier discussed. A study by Kennelly, Taylor and Maxwell (2008) submits that, relevant pedagogical content knowledge is important in reinforcing the teachers' determination to implement the teaching of EE or education for sustainability (EfS) in schools and is imperative that this is developed during pre-service teacher education to ensure its implementation upon completion. This presupposes that EE teachers in colleges of education must be competent in this area to be able to pass this on to pre-service teachers. It also points to the need for teacher educators to be upskilled with how to use subject content, pedagogies and assessments in teaching EE.

4:2:3 Approaches to Teaching Environmental Education

Taking a stance on whether EE should be taught as an integrated subject or as a stand-alone subject has been at the centre of the complexity of EE since its introduction into mainstream education with several researchers taking a stance for one approach or the other. Jackson (1992) argues that when identified and treated as single, separate or unique, a subject is given its own time and space in the curriculum. Yet, the guiding principle of EE curriculum is the 'whole' concept idea of a holistic approach advocated by UNESCO (1992) and other researchers such as Smyth, 2006; Palmer, 2002; Stokes, 2001; Tilbury, 1995; Palmer and Neal, 2003. UNESCO also advocates that students should be involved in planning their learning experiences and that varied environments for learning should be employed. They also maintain that a broad range of educational approaches to teaching and learning should be considered to provide opportunities

for active involvement at all levels of EE (Kridel, 2010).

Robottom and Hart (1993) outline three paradigm approaches in EE which are positivists, interpretivist and critical approach. These approaches they explain is what influences teaching methods in EE. In the realm of the positivist approach, teachers are the keepers of knowledge whereas students are passive recipients and standards and methods of teaching and learning in natural sciences are applied. In the interpretivist model, a teacher is an organizer of experiences and students are active learners and activities conducted allow for personal experiences through which learning occurs. In the critical approach model, teachers are collaborative participants with students who are actively generating their own knowledge and involved in actions that respond to environmental problems.

According to Chi Kin Lee and Williams (2001), an examination of curricula from many countries show that proposals for EE overemphasize the knowledge component. Kridel (2010) also notes that in developing practice of EE in schools, one trend has been for teachers to first teach about the environment usually in a classroom setting before moving out into the environments to carry out activities or investigations, but Bartosh (2003, p. 25), reports that many EE practitioners see their role as "organizing engaging hand-on activities in the environment for their students and allowing them to generate their knowledge and self-reflect on their learning". Whereas Bartosh (2003) is of the view that teaching approaches in EE are evolving from the interpretivist model toward the critical model, Kridel *(*2010, p. 342) notes that involving students in "environmental action is not yet common practice".

4:2:4 Methods of Instruction in Environmental Education

Methods of instruction no doubt affects student learning, some methods may work well in teaching certain topics than others in certain environments and it is left to the teacher to figure out which method best teaches a topic. According to Iozzi (1989b), many types of teaching

methods seem to be effective in improving environmental attitudes and values. For example, findings of research by Hitz and Scanlon (2001), Klein and Merritt (1994) and Lord (2010) revealed that students who attended traditional teacher-centered classes showed better results instantly after the program, however, students' ability to use knowledge and skills acquired with greater level of retention over time was exhibited when they were taught using project-based method. Lord (2010), Klein and Merritt (1994), opine that constructivist teaching approach leads to improved student performance in developing critical thinking, interpretation and analytical skills. Research has also revealed that simulations are not superior to traditional teaching methods for promoting more positive environmental attitudes (Bazan, 1976; Dispoto, 1977a and b; Fennessey, Livingston, Edwards, Kidder and Nafziger, 1974), however, such approaches serve as models of reality and are more enticing and interesting to students (Iozzi,1989a). Aird and Tomera, (1977) advocates for use of guided discovery in EE, while Hepburn (1978) insists on interdisciplinary teaching approaches in developing attitude change in EE. On education that seeks to develop the affective domain, Blum (1981) discovered that open-ended inquiry method of instruction had a positive effect. Gross and Pizzini (1979) report that apart from the fact that students thought the affective unit taught outdoors was interesting and useful, it produced a significant change in student attitudes toward the environment. Davis, Doran and Farr (1980) as well as Carlson and Baumgartner (1974) report that experiences involving outdoor camping activities result in more positive attitudes toward the environment. A study by Gross (1978) also showed positive attitude was exhibited following participation in an acclimatization type of EE experience. However, as Dewey (1933) points out, experiences do not automatically equate learning and therefore, reflective discussions on feelings and emotions may also be imperative together with experiences. It is evident from the research reports that methods which involve student activity, participation, engagement and reflective

sense are more likely to succeed in EE. In this sense the interpretive -critical approach of teaching (Robottom and Hart, 1993) produces better results in EE than the positivist approach. But, irrespective of the methods or approaches used in teaching EE, Luontokoulutoiminta (1997) insists that the educational emphasis for teachers should be on strengthening environmental values and increasing environmental knowledge. A 10-year research carried out in the United States of America revealed that, hallmarks of effective EE programs include hands-on activities, investigational approaches, out-of-the-classroom experiences, and student-directed learning and yet as the study revealed, few schools make use of these approaches, relegating EE to a traditional lecture style, "information only" format (Coyle, 2005, p.13) and so to produce individuals who are environmentally literate, who can and do act in environmentally sustainable ways, will involve educational strategies that give learners a sense of involvement and ownership.

4:2:5 Continuous Professional Development (CPD)

The effectiveness and competence of teachers in any educational program is as important as the 'life' of that programme itself and so CPD must be present if such education is to succeed. The need for CPD in education and to adequately prepare teachers to promote EE is critical (Corcoran, Shields, and Zucker, 1998; Robottom, 2000; Tilbury, 1992). Such programs help teachers to learn and apply new knowledge and skills that will improve their practice. According to Robottom, (2000), professional development is recognised as a priority in the field of EE and is pertinent in realising the goals of EE, to the extent that international education agencies such as the Organization for Economic Co-operation and Development (OECD) and UNESCO pay serious attention to it.

Research has shown that many teachers learned to teach using a model of teaching and learning that focused heavily on memorizing facts (Cohen, McLaughlin and Talbert, 1993;

Darling -Hammond, 1995; Porter and Brophy, 1988). According to Wilke, Peyton and Hungerford (1987, p. 1), "few, if any teacher training programmes adequately prepare teachers to effectively achieve the goals of EE in their classrooms". Research has also revealed that the status of in-service training or professional development for EE in teacher education remain at an unsatisfactory level (Fien and Rawling,1996; Robottom, 1987) and not organised as frequently as should (Tewksbury and Harris, 1982). Robottom, (1987) explains that there may be a disparity between the practical classroom models of many teachers, which emphasise academic knowledge, didactic teaching, and classroom theory, and the more progressive or reformist pedagogical theory underlying goals of value transformation and social change in EE. Apart from these, many teachers received their education and training long before the emergence of interdisciplinary courses in environmental studies and the development of critical approaches to teacher education which have the potential to empower teachers to work for constructive social change (Grant, 1984; Smyth, 1989). There is also the issue of individual differences, and experiences toward environmental issues (Tuan, 1990). And so, the need to "alter the professional practices, beliefs, and understanding of school persons (teachers inclusive) toward an articulated end" (Griffin, 1983, p. 2) has never been more important. The end in this case being effective teaching of EE and so, continuous professional development must be used consistently to ensure that educators continue to strengthen their practice throughout their career.

4:2:6 Teacher Experiences and Teaching Environmental Education

Kennelly, Taylor and Maxwell (2008), Shuman and Ham (1997) report that life experiences (involving feelings, attitudes, knowledge and emotions developed in ones' interaction with the environment) influence teachers' commitment to implement EE. Shuman and Ham (1997) state that these experiences are informed by the habitus (Bourdieu 1984) and can occur at any time

throughout childhood, college and adult phases. Esa (2010) suggest that teachers' life experiences, serve to shape their beliefs and inculcate values that are retained and reinforced during the teachers' life. Life-span developmental theorists (Manaster and Perryman, 1974; Mohney and Anderson, 1988; Skovholt and McCarthy, 1988; Stewart, Lykes and LaFrance, 1982) have identified life events or experiences as important antecedents of behaviour development including experiences in nature and adult environmental behaviour as well as career choice. For instance, based on interviews with approximately 2000 adults across the United States, Wells and Lekies (2006, p. 14) found childhood outdoor experiences had significant positive effects on adult environmental attitudes and behaviours. They reported that "When children become truly engaged with the natural world at a young age, the experience is likely to stay with them in a powerful way - shaping their subsequent environmental path". According to Shuman and Ham (1997, P.30) "beliefs and values which are moulded by the teacher's experiences turn to influence teachers' attitude, subjective norms and control they have in teaching EE". They explain that teachers who as children engaged in a variety of outdoor activities, read nature magazines and books, spent time at a nature centre, and participated in organized outdoor experiences may have sustained these experiences throughout their lives, and these experiences may have influenced their commitment to EE just as opined by developmental theorist theorists (Manaster and Perryman, 1974; Mohney and Anderson, 1988; Skovholt and McCarthy, 1988; Stewart, Lykes and LaFrance, 1982). They however suggest that other teachers may have had college classes that involved hands-on EE or had in-service EE workshops that provided the stimulus for teaching EE. So, in addition to personal experience, structured learning experiences are also important and thus influence a teacher's teaching of EE. Iozzi (1989a and b) explains that teachers can create negative attitudes and feelings toward a topic or issue unintentionally simply by the way they prepare, organize, and

present material to students. But when teachers care about issues, they tend to teach about such issues (Yero, 2010; Sund and Wickman, 2008).

4:2:7 Environmental Education and the Media

The media is a powerful source for influencing environmental attitudes and values and should not be ignored in the comprehensive approach to EE (Alaimo and Doran, 1980b; Coyle, 2005; Zimmerman, 1972). Coyle (2005) indicates that for most adults, the media is the only stable source of environmental information. Media impact on EE should not be ignored or underestimated by educators or stakeholders. For students and others who may not or have not experienced formal education, the media may perhaps be their main source of information or misinformation or confusion on environmental matters. Pearson, Dorrian and Litchfield (2011) found that new forms of media, including internet-based visual presentations, can be utilised to increase knowledge, attitudes and intentions for behaviour relating to conservation practices. Research also shows that students' attitudes towards the environment are influenced by watching nature films and reading about the environment (Eagles and Demare, 1999) which is important for teachers to update their knowledge and pedagogical skills. It is therefore important for stake holders to ensure a collaborative approach with media in EE.

4:2:8 Environmental Education and Politics

"This world is a strange madhouse. Currently, every coachman and waiter is debating whether relativity theory is correct. Belief in this matter depends on political party affiliation." (Einstein, 1920, p. 428). This is a quote from Einstein's letter to his friend Marcel Grossmann, resulting from opposition to his theory of relativity. The political lens that existed then exists now across continents, countries, between communities and among individuals. It reflects in everyday life and affects varied issues from governance through economics to environment. Hamilton (2012, p.6) notes that some political sections promote the views of climate deniers

and publish stories designed to discredit climate scientists, all with a view to "defending an established order seen to be threatened by evidence of a warming globe and the aim has been to make the public view science through political lenses". This is worth considering because the interdisciplinary nature of EE incorporates among others, politics which threads with sociology and public participation. Although some scholars on the environment (Kenis and Mathijs, 2012; Læssøe and Ohman, 2010) raise questions about the value of fostering political engagement, others (Chawla and Cushing, 2007; Hungerford 2009; Huckle, 2001; Jensen and Schnack, 1997; McClaren and Hammond 2005; Stapp, 1996) opine that environmental political participation is an essential component of addressing the challenges of sustainability. Although the political aspect of EE is not explicit in the traditional models for teaching EE and not much research has been done directly in importing environmental politics into EE, Levy and Zint (2013) stress that it is a very important component that should be addressed.

Environmental politics is not new to environmental education and most definitions of EE past and present have always contained undertones of the political dimension of EE. For example, Stapp *et al*., (1969) in their definition of EE emphasise the need to prepare individuals to influence their governments. The UN definition of ESD includes the promotion of democratic and participatory systems (UNESCO 2014). Levy and Zint (2013) note that citizens have engaged in numerous successful efforts to persuade their local, state, and national governments to adopt more environmentally sustainable policies. Examples of such actions include the passage of the Clean Air Act and Clean Water Act in the early 1970s in the USA (Shabecoff, 2003), another is the prevention of a dam construction on the Gordon River in Australia in the early 1980s (Doyle and Kellow, 1995). For citizens to be able to 'pressure' governments into sustainability actions, they do not only need to be knowledgeable and skilful in environmental issues but also need to be knowledgeable in the global, national and local politics of the

environmental issues they raise.

Recent participation of governments in Earth summits and other platforms where the protection of the environment has been the focus demonstrates at least interests of governments in environmental matters and point to a socio-political dimension of EE. The goal of fostering increased environmental political participation will be to empower individuals to share the concerns, interests, and specialized knowledge that they have about their environment with officials and decision-makers whose choices can have substantial consequences for environmental sustainability (Levy and Zint, 2013). It is therefore imperative, that environmental educators are well grounded in such matters of politics and policies that affect the environment and EE to be able to groom young teachers to do and pass on the same. The curriculum must therefore address issues of socio-political nature that affect EE.

4:2:9 Barriers to Environmental Education

Research including those of Ham and Sewing (1988), Tewksbury and Harris (1982) has shown that although teachers may have strong intentions to teach EE, the act of teaching and or effective teaching may not occur because of existing barriers. According to Mills and Tomas (2013), some of these barriers include, perceived relevance and priority of EE at the school and course level, institutional attitude to sustainability practices as well as stakeholders' collaboration all affect EE. Evans, Whitehouse and Gooch (2012) identified what they classified as grassroots, administrative and conceptual barriers. Grassroots barriers included an overcrowded curriculum, insufficient teacher knowledge and a lack of training opportunities in sustainability education. Conceptual barriers span from a lack of agreement about the scope and content of EE to misconceptions such as EE being relevant only to science curricula or seen as a separate subject to be added to the existing curriculum (Clark 1975; Hungerford 1975; Langseth 1982). A study by Tan and Pedretti (2010), identified over-crowded curriculum, lack

of resources, low priority of environmental education in schools, limited access to the outdoors and student apathy to environmental issues as factors that hinder proper EE. A study by Tewksbury and Harris (1982) identified time as a barrier to teaching EE. Other barriers included logistical, conceptual, educational and attitudinal barriers. Important logistical barriers included lack of instructional materials also identified by some researchers (Pettus and Teates, 1983; Mirka, 1973; Trojcak and Harvey, 1976) and lack of funding, also identified by Childress, (1978) and McCaw, (1980). Other factors include class size, attitude of the principal, transportation problems, and availability of outside study areas, safety problems, and liability worries (McCaw, 1980; Mirka, 1973). Another barrier to EE identified is teachers doubting their own competence to teach EE. Ham and Sewing (1988) and Mirka (1973) note that teachers with a poor background in a discipline may lack the personal interest or commitment to provide adequate instruction in that subject. On Attitudinal barriers, Bethel, Ellis and Barufaldi (1982) as well as Jaus (1978) have indicated that when teachers do not have positive attitudes toward EE, very little instruction in that area will occur in the classroom.

Studies have shown that teachers have neutral or negative attitudes toward science and tend to teach little or no science (Spooner and Simpson, 1979), it therefore implies that EE which is mainly perceived as a science subject or worse, offered in a science curriculum will have little teaching occurring in such instances. Stevenson (2007) notes that the recent critical and action orientation of EE creates a challenging task for schools. Also, research has shown that inadequate incorporation of EE within teacher education is one of the obstacles to successful implementation of EE in schools (Babiuk and Falkenberg 2010; Cutter and Smith, 2001; McKeown and Hopkins, 2002; UNESCO, 1997). Shuman and Ham (1997) however note that despite these challenges, when teachers are more committed to teach EE, they will be more determined to overcome the barriers they face, a point shared by Yero (2010) who explains that

teacher commitment helps in overcoming challenges in their field of practice.

CHAPTER FIVE

THEORETICAL FRAMEWORK OF STUDY

Framework has been described as a map that guides a study or directs a rationale for the development of research questions or hypotheses (Fulton and Krainovich-Miller 2010) and helps to ensure the researcher's mind is focused on the goals of the research. According to (Fain, 2004; Parahoo, 2006; Green, 2014), the terms theoretical and conceptual framework have often been used interchangeably even by authors. In trying to distinguish the two terms, Fain suggests that where a framework is based on theories, it should be called a theoretical framework and when it is based on concepts, it be called a conceptual framework. Parahoo (2006) suggests that a theoretical framework should be used when research is underpinned by one theory and a conceptual framework may draw on concepts from various theories and findings. Any theoretical framework for this study, must address experiences and perceptions and how these relate to practice, since that is what this research seeks to address. Since teaching is a social practice, I have decided to start from theories that relate to social practice.

5:1 Social Practice Theory (SPT)

There are a lot of theories about social practices. From Bourdieu, (1977) and Giddens (1984) to Schatzki (1996) and Reckwitz (2002) and more recent work by Shove, Pantzar and Watson (2012) among others. Lobkowicz (1967) traces the concept of theory and practice back to Plato, Aristotle and Plotinus. He refers also to the Hegelian relation between theory and practice which appeared under the heading of the opposition between *Sein* and *Sollen,* 'that which ought to be and that which is' and the merging of *Sein* and *Sollen* 'making reality (or practice) exactly as it ought to be'. Practice theory is strongly associated with the French theorist, sociologist, anthropologist, philosopher and renowned public intellectual, Pierre Bourdieu. Bourdieu's concept of habitus represents an important formulation of the principles

of practice theory. In his practice theory, Bourdieu identifies habitus, field, capital and practice as concepts of a framework that discuss and explain human interactions at both individual and social levels. Although these concepts may be used in isolation, Bourdieu and Wacquant (1992, p. 96) explains that "such notions as habitus, field … can be defined, but only within the theoretical system they constitute, not in isolation". Blumenfeld–Jones (2003, p.2) also notes that "field and habitus are themselves in relation to each other and only explicable (capable of being explained and understood) through their relationship. Neither is meaningful without the other". Bourdieu himself intimates that capital, habitus and field necessarily affect practice or that practice results from an interaction between capital, habitus and field. In operating (practicing) within a field, an individual uses capital (the sum of the resources, actual or virtual, available to an individual or a group) and his habitus (past and present experiences which shaped and still shape one's perceptions and understanding). And so, in their functional or operationalised state, these concepts interconnect.

5:1:1 Habitus

Habitus is a Latin word that refers to "a habitual or typical condition, state or appearance, particularly of the body" (Jenkins, 1992, p.74). According to Krais and Gebauer (2002), the concept of habitus dates to Aristotle who described it as created based on experience and the memorization of various actions through physical processes. Bourdieu defines habitus as "A structuring structure, which organises practices and the perception of practices." (Bourdieu, 1984: P.170). It is "the way society becomes deposited in persons in the form of lasting dispositions or trained capacities and structured propensities to think, feel and act in determinant ways, which then guide them" (Wacquant 2005, p. 316). According to Burkitt (2002), habitus is acquired via primary socialisation into the world through our incorporation in the family, culture and the milieu of education (Hawthorn, 2014).

According to Bourdieu (1984), habitus has the potential to influence our actions and to construct our social world as well as being influenced by the external. Habitus can therefore change with age, travel, education and parenthood as well as new exposure among others and so two people cannot have the same habitus. Bourdieu intimates that habitus can be modified in the face of other fields or due to "an awakening of consciousness and social analysis" (Bourdieu and Wacquant 1992, P. 167) and so individuals in a field may change their previous habitus to respond to the needs of their new environment. Since habitus is embodied in the individual, it will follow that learning a new habitus will involve the transformation of deep-seated habituations of mind and life and can prove difficult or unwelcoming to the individual especially if the transformation does not fall in the natural experiential acquisition process or normal life routine of the individual or if such transformations are 'distasteful' to the individual. But even though habitus is not fixed and prone to change, Bourdieu explains that the habitus seeks to conserve its characteristics by being generally conservative and resistant. The habitus Bourdieu explains is "embodied in one's history" (Bourdieu 1990, p.56) and so individuals may bring the habitus they have previously acquired to a new field, but this may or may not be useful in the new field depending on the practice in the new field. Bourdieu states that there can be a struggle or tension between what has been accumulated through the individual's experiences or habitus and what is expected or pertains in the field of practice. He further explains that these dispositions shaped by past events and structures which in turn shape current practices and structures, condition our very perceptions of such experiences and thus gives us indications or clues to respond to practices of similar characteristics should we encounter them in future (Bourdieu,1976).

Research by Hargreaves (2011) applied the insights of social practice theory to a study of pro- environmental behaviour change through an ethnographic case study and revealed that

greater research and policy attention should be paid to the complex task of generating more sustainable practices. Haluza-DeLay (2008) while drawing on Bourdieu's sociological approach, argues that the environmental movement would be better served by working to create an ecological habitus which would underpin ecological lifestyles and environmental social change. He refers to this as re-educating the habitus and notes that the challenge is to help people internalise new depositions. Larson, Garland and McCiaig (2009) explain that in carrying out a study in a field, one should analyse the habitus of the agents within a field. In this light, the important question in this research linked to habitus will be whether the habitus of EE teachers support their practice and if not, whether their habitus can be re-educated by expanding their capital and exposing them to deliberate experiences through CPD in a transformational way so that with time they are embodied or internalised with dispositions for effective teaching of EE.

5:1:2 Field

Whereas habitus can assume either an individual and social nature or character, field is solely social in its nature. According to Bourdieu (1984), society is split up into spheres of action which he called fields where agents and their social positions are located and within this field each agents' position results from the interaction between the rules governing the field. Each field (be it in education, law or art) has its own set of positions and practices and within these social fields people struggle for position and play to win.

According to Bourdieu (1990), fields can interact with each other. For example, in a religious based College of Education, fields of education and religion may interact or overlap. Bourdieu (1993) intimates that fields may also be subordinate to larger fields of power and class relations and so fields are hierarchical. Bourdieu (1983) in *The Field of Cultural Production*, talks about tensions which occur when fields depend on others for their position. This will suggest that

fields may be in overriding or dominated positions as compared to other fields, but then he states that "every position, even the dominant one, depends for its very existence, and for the determinations it imposes on its occupants, on the other positions constituting the field". (Bourdieu, 1983, p. 312). The relationship between fields and their agents as well as the characteristics of fields and their connotations of power and space to operate and desire of playing to win may have implications and consequently affect the field where the teacher practices. Even within the field of the colleges themselves structured with hierarchical powers, it will not be odd to see such struggles existing and affecting the EE teacher who is also an agent of the field.

According to Bourdieu (1984), the relationship between habitus and field is two-way. The field exists only insofar as social agents have the outlooks or dispositions and set of perceptual representations that are necessary to constitute that field and imbue it with meaning and by participating in the field, agents incorporate into their habitus the proper know-how that will allow them to be functional within the field. A habitus will therefore thrive only in a social field that supports its efficacy. For an individual (embodied with the habitus) to interact in an environment (the field) to bring about an action (practice), the individual makes use of certain resources which Bourdieu refers to as capital.

5:1:3 Capital

According to Bourdieu (1986, p.46), capital is "accumulated labour (in its materialized form or in its 'incorporated' embodied form) which, when appropriated on a private, that is exclusive basis by agents or groups of agents enables them to appropriate social energy in the form of reified or living labour". Bourdieu identifies four types of capital, cultural, social, economic and symbolic.

5:1:3:1 Cultural Capital

Bourdieu (1986), explains that this includes a person's education (knowledge and intellectual skills) that provides advantage in achieving a higher social status in society. He further explains that cultural capital exists in *Embodied, Objectified* (physical) and *Institutionalized* states. The embodied state has roots in the family environment of early childhood, in which values, skills, and manners are cultivated and which form lasting dispositions of the mind and body. An individual's dialect is an example of embodied cultural capital. The objectified state of cultural capital refers to physical possessions of cultural goods which may include pictures, books, works of art etc., while the institutionalized state of capital can refer to academic credentials and professional certifications.

5:1:3:2 Social Capital

This refers to "the sum of current and potential resources which are linked to possession of a network of lasting relations, of institutionalised shared acknowledgement and recognition; or, in other words, belonging to a group, as the sum of agents who not only share the same characteristics (liable to be perceived by an observer, by others and themselves) but also joined by permanent and useful connections" (Bourdieu, 1980, p. 2). Social capital will thus comprise of both the network and the assets that may be mobilized through such networks (Bourdieu, 1986; Burt, 2000). For example, Leana and Pil (2014) found out that some maths teachers sought help and advice from their colleagues in most instances. This indicates a kind of social capital for the maths teachers within that school or field.

5:1:3:3 Economic Capital

This refers to command of economic resources such as money, assets and property. Bourdieu (1986, P. 91) sees economic capital as the root of all other forms of capital and treats all other types of capital as "transformed, disguised forms of economic capital". Other forms of capitals

can be converted into economic capital such as converting educational credentials into a high paying professional position. Economic capital can also be used in pursuit of other forms of capital such as using family income to pay for school tuition and tutoring services (Cheng, 2012) which is a form of cultural capital.

5:1:3:4 Symbolic Capital

Bourdieu (1993, p. 37) describes the concept of symbolic capital as "being known and recognized and is synonymous with good standing, good name, honour, fame, prestige and reputation.'' Such value as perceived by others and the power that accompanies this evaluation by others is not immediate but usually built over time and thus, symbolic capital is defined through its function of mediating power through prestige, and can consist of economic, social or cultural capital (Fuller and Tein, 2006). Economic, cultural and social capitals may tend to function as symbolic capital at different degrees. It might therefore be better to speak in rigorous terms, of the "symbolic effect of capital" when it obtains explicit or practical recognition (Bourdieu, 2000; Bourdieu, 1997, p. 242). For example, an EE teacher who is a head of department may be in 'higher standing' as compared to his colleagues. Although all individuals may possess social or cultural capital to practice in the field, not all forms of capital are equally valued, and their value is dependent from the field in which they operate (Grenfell, 2009). Capital will therefore become of value when it is used or activated within a field to improve one's position on the field.

The practice of a field is shaped by habitus of its agents and the capital they possess. The elements of Bourdieu's theory (Habitus, field, capital and practice) can thus be applied to social practices to better understand and improve upon them. Karol and Gale (2004) believe both teachers and students have the potential to develop a habitus of sustainability and if students are denied access to environmental capital from the very first years of schooling, the collective

habitus required to create a sustainable world may never happen. I have earlier stated that Bourdieu's practice theory is hinged on a quadruplicate concept of habitus, field, capital and practice, I have discussed the first three and considering that this research is hinged on the practice of teaching and the experiences and perceptions of teachers who practice this practice of teaching, it is important to address the concept of practice.

5:1:4 Practice

So, what is practice? According to Rawolle and Lingard (2008), Bourdieu never offered simplistic definitions of practice. They note however that Bourdieu indicates interest in the concept of practice in the books: *Outline of a Theory of Practice* (Bourdieu, 1977); *Distinction* (Bourdieu 1984); and *The Logic of Practice* (Bourdieu, 1990). They explain that he constituted the concept of practice as one for activities or actions that have a social character and meaning, offers specific details and structure, and effects of which emerge in research. Using the analogy of a game in *The Logic of Practice*, Bourdieu (1990, p. 66), refers to practice as a "feel for the game." This logic of practice goes beyond a simple execution of the practice, it includes learning the rules and conventions of the field and the most appropriate strategies to use. According to Reckwitz, (2002, p. 249), a practice is "a routinized type of behaviour" which exist as "a block" or "a pattern which can be filled out with a multitude of single and often unique actions" (Reckwitz, 2002, p.250) and that there are different elements in these blocks which are interdependent including "forms of bodily activities, forms of mental activities, things and their use, a background knowledge in the form of understanding, know how, state of emotion and motivational knowledge" (Reckwitz 2002, p.249).

Hager, Lee and Reich (2012) outline five principles of theorising practice. They explain that; practice is more than the application of theoretical knowledge, there should be a relationship between practice and knowledge that sees knowledge as something possessed in the mind to be

transmitted; reasoning based on action and experience and knowing-in-practice then becomes a collective and situated process of linking, knowing with working, organising, learning and innovating; practice should be understood as a human phenomenon involving human and non-human actors in space and time; practice is embodied and relational; practice is neither stable, homogenous or ahistorical, it exists and evolves in historical and social context-time, places and circumstances and they take shape at the intersection of complex social forces, including the operations of power and regimes of practice which govern the way we work, practice and learn; practice is emergent and thus while having an inherent retrospective dimension, the manner in which practice changes and evolve cannot be fully specified in advance. Practice being embodied and relational will turn our attention to the teacher's habitus, capital and the field where the teacher practices which have been discussed at length earlier. Practice evolving within time, space and circumstances and the fact that this evolution of practice cannot be fully known in advance points to the fact that the teacher must always be brought to date and in tune with practices that work within a given circumstance at a time and space. For example, teaching has evolved from teaching using a blackboard and chalk in a classroom of children who are quite and sitting to more interactive and engaged teaching using modern technology and pedagogical content skills.

In using Bourdieu's SPT to guide this research, I have considered the divergences which his work has provoked. Critics who have focused on the notion of the habitus have argued that this concept slips into the objectivism which Bourdieu sought to refute (Jenkins, 2014; King 2000; Schatzki 1997) whiles others (Harker 1984; Taylor 1993; Wacquant 1987) maintain that he presents a genuine advance in social theory. For some, Bourdieu simply offers an extra set of concepts which can be employed to explain a range of social phenomena whereas others think he provides a more extensive theory of practice (Grenfell, 2004). According to Grenfell and

James (1998, p. 2), "…research in terms of Bourdieu's theory of practice offers insights and understandings not readily visible to other approaches". The use of Bourdieu's theory in this study will guide me to present findings and analyse responses from participants specifically in relation to their individual capital and habitus and will also help to position the development of the field within social practice. The diagram below shows the relationship and interdependence of concepts of Bourdieu's SPT in the field of education and in relation to the teacher.

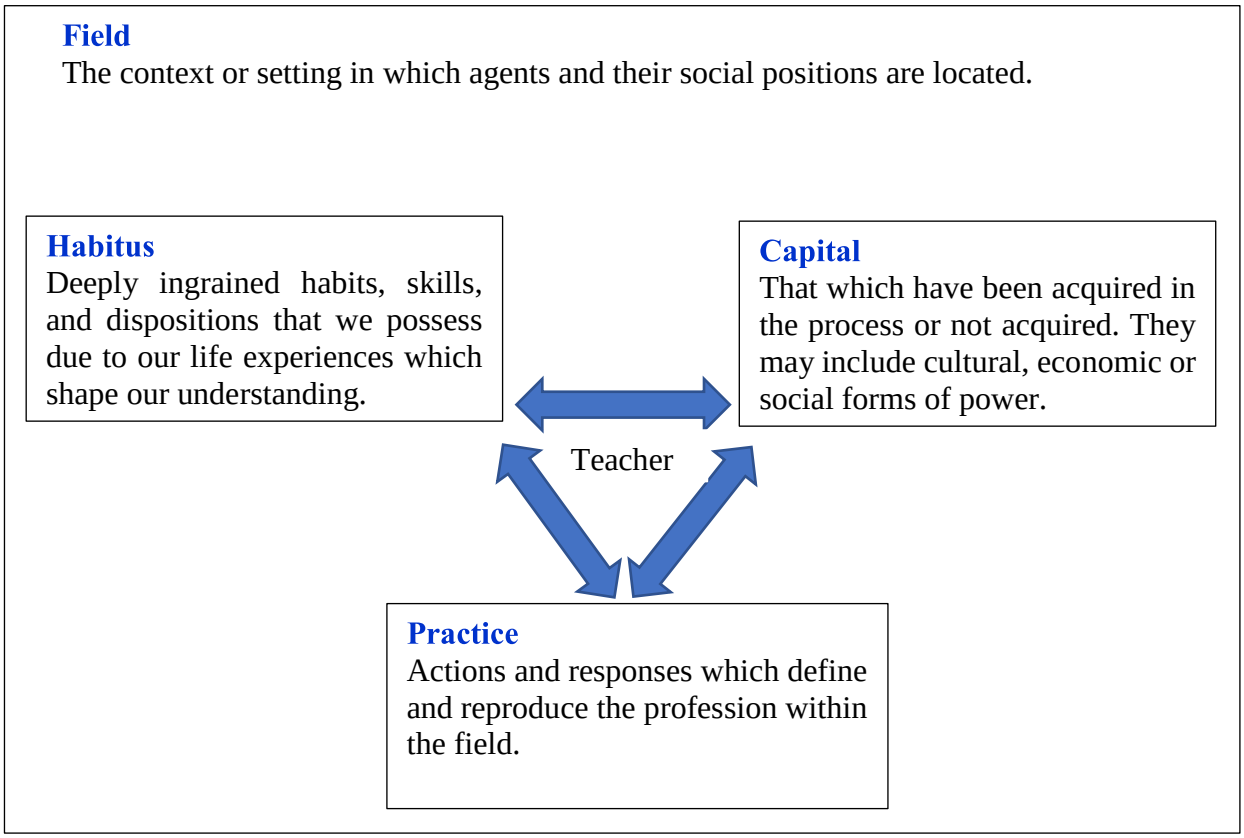


Figure 5.1: Conceptual Framework Based on Bourdieu's Social Practice Theory

5:2 Heidegger's Dasein and Bourdieu's Habitus and Capital

Heidegger (1962) presents an analogy of *Dasein* or us being 'thrown' into a pre-existing world of people and objects, language and culture and therefore not meaningfully detached from the world. Heidegger's analogy will suggest that individuals born at (or thrown into) different places will be subjected to different socio–cultural environments. They will be advantaged and disadvantaged differently in relation to their experience of a phenomenon and

how that may affect their practice. For example, if a child is born into an environment where the family and society recognised, practised and reinforced environmentally friendly behaviour, that would form part of the growing experiences the child becomes embodied with (What Bourdieu refers to as habitus). If such concepts are taught in school, this child would probably have an advantageous start (cultural capital) and can relate to such concepts, appreciate and understand them better. This may further lead such a person to acquiring certification (Bourdieu will refer to this as institutionalized capital). If such a person is to teach (practice) in an institution (what Bourdieu refers to as field), these experiences may be brought to bear on such a teacher's practice of teaching. The extent and content of course may vary, depending on the curriculum and other factors that come into play in such an institution or field but nonetheless this experience is likely to play a part in the teacher's practice. Such a teacher will teach with much more conviction of such a practice as conservation. If we compare such a teacher to a teacher who grew up or was 'thrown' in an environment that had no regard for environmentally responsible behaviour, the dynamics with the same setting outlined previously may change, unless such a teacher has encountered an experience that will transform his or her habitus or change his or her dispositions on environmentally responsible behaviour. This gap created by socio– cultural backgrounds of the individuals must be bridged at least through education because an environmentally friendly habitus is not automatic, it must be deliberately imbued.

CHAPTER SIX

METHODOLOGY AND METHOD OF RESEARCH

Langdridge (2007) defines methodology as a general way in which a topic is researched whilst method refers to specific technique(s) being employed in a research. According to Bogdan and Taylor (1975) methodology refers to the process, principles and procedures by which a researcher approaches a problem and seeks answers to such a problem. Somekh and Lewin (2005, p.346) explain that methodology involves "the collection of methods or rules by which a particular piece of research is undertaken" including "principles, theories and values that underpin a particular approach to research". In most instances, methodology is seen as the general approach to research which is usually connected to a paradigm while the methods generally deal with procedures or tools often used for data collection and analysis. This chapter therefore describes the methodology guiding the study (paradigm, research orientation, research design and its philosophical assumptions) and then the methods employed in this study for data collection and analysis are discussed.

6:1 Research Paradigm

Cohen and Manion (1994, p.38) refer to a paradigm as the "philosophical intent or motivation for undertaking a study", whilst Bogdan and Biklen (1998, p.22) define paradigm as "a loose collection of logically related assumptions, concepts, or propositions that orient thinking and research". Mac Naughton, Rolfe and Siraj-Blatchford (2001, p. 32) identify three elements that characterise or embody the definition of a paradigm: "a belief about the nature of knowledge (epistemology), a methodology and criteria for validity". Without nominating a paradigm as the first step, Mackenzie and Knipe (2006) argue that there will be no basis for subsequent choices regarding methodology, methods or research design.

6:1:1 Which Paradigm?

One of several paradigms such as positivist (and post positivist), constructivist, pragmatism or transformative paradigms may anchor a study. Positivist tradition typically focuses on physical realities of individuals and is sometimes referred to as the Scientific Method. It "reflects a deterministic philosophy in which causes probably determine effects or outcomes" (Creswell, 2003, p.7) and is mostly aligned with quantitative research (Creswell, 2003/2009; Mackenzie and Knipe, 2006). Constructivists usually rely on participants or research subjects' views of a phenomenon or a situation being researched (Creswell, 2003) and recognise the impact of their own background and experiences on the research (Mackenzie and Knipe, 2006). They thus draw on the meaning and sense- making of the participant with regards to the phenomenon. They usually make use of qualitative or mixed methods in research (Creswell, 2009). Pragmatists usually centralise the research problem and apply all approaches to understanding the problem (Creswell, 2003), whereas transformative researchers "believe that inquiry needs to be intertwined with politics and a political agenda" (Creswell, 2003, p.9). They feel the need to address issues of social justice and marginalised people which in their view is not well addressed by constructivist approach (Creswell, 2003). Both transformative researchers and pragmatists may employ mixed methods in research (Creswell, 2009; Mertens, 2005). In this research, the data gathered was based on the realities, views or meaning making perspectives, experiences and perceptions of EE teachers and so the study identifies with the constructivists' paradigm or approach.

6:1:2 Constructivist Paradigm

The approaches employed by constructivists are geared towards understanding "the world of human experience" (Cohen and Manion, 1994, p.36), and so lends itself to the school of thought that "reality is socially constructed" (Mertens, 2005, p.12) and so, of importance to this

way of thinking and research is the participants view of the phenomenon under study or "participants view of the situation being studied" (Creswell, 2003, p.8). Constructivism is therefore considered as an interpretative stance and constructivists are also referred to as interpretivists. Constructivism considers human beings (participants or subjects of research) as active people making sense out of their world or their realities acquired through their senses, opinions, attitudes, beliefs, prejudices and other mental processes obtained through individuals and groups which constitute the lived experience of individuals (habitus). According to Guba and Lincoln (1994), this aspect of lived experience is often lost and not explained by conventional scientific approaches and it contrasts objective and physical truth which conventional scientific methods seek to find. Unlike positivists, constructivists do not generally begin with a theory but rather "generate or inductively develop a theory or pattern of meanings" (Creswell, 2003, p.9). To this end, Lincoln (2005, p.61) is of the view that "constructivists aim to counterbalance the strong behaviourist and measurability foci of experimental social science with a reemphasis on the immeasurable forms of meaning, and…deep understanding of the meaning-making processes".

In aligning with the constructivist paradigm in this research therefore, an objective reality was not the focus, neither were there predictions made or causes and effects identified. Rather the study sought to discuss the experiences and perceptions of EE teachers to shed light into their reality and bring it closer to the researcher. The recounted experiences or realities of participants were thus heavily relied upon. In fact, it became the primary data for the research. While focusing on the meaning participants make of their experiences, Mackenzie and Knipe (2006) state that a researcher operating within the constructivist's paradigm needs to recognise the impact or influence of his or her own background and experiences on the research.

6:2 Why a Qualitative Research?

Although I do not wish to join debates on which research method or data collection and analysis or explication process is superior in terms of research persuasions (for I think each one is a means of achieving good research outcomes depending on the intent and nature of the study), I intend to give reasons why I chose a qualitative approach to this research and hence qualitative methods for data gathering and explication. To start with, constructivist persuasions which guided this study can be aligned with qualitative research. According to Pope and Mays (1995, p. 43) "The goal of qualitative research is the development of concepts which help us to understand social phenomena in natural (rather than experimental) settings, giving due emphasis to the meanings, experiences, and views of all the participants". The above goal of qualitative research agrees with the constructivist paradigm or approach which is considered for this research. According to Patton (2002), qualitative methods serve to better embody lived experiences which is what this study sort to explore. Yero (2010) notes that a teacher's beliefs and way of thinking shaped by experience of culture (habitus) influences his or her teaching (practice). She argues that "teacher thinking" may, in fact, be the most important variable in the educational equation. Methods employed in gathering data for qualitative research allow people to speak their "own mind" (their own thinking) and this informed the use of qualitative methods for this research. Qualitative research techniques are primarily used to trace meanings that people give to social phenomena and interaction processes, including the interpretation of these interactions and this gives deeper illumination and a more meaningful explanation of the phenomenon being investigated (Pope and Mays, 1995; Reeves, Peller, Goldman and Kitto, 2013).

6:2:1 Which Type of Qualitative Research?

Having established why qualitative methods needed to be used for this research, the next

question was, which type of qualitative research will be appropriate? There are several qualitative research methods that can be applied in various qualitative studies. Creswell (2013) outlines five categories of qualitative research which are ethnography, narrative, phenomenology, grounded theory, and case study. Although they have similar methods of data collection (usually including text review, observation and interviews) which may sometimes suggest a certain similarity at a point, the purpose of each study and their nature makes it possible for them to be differentiated.

Ethnography has its roots in cultural anthropology where a researcher is immersed within a culture, sometimes for years and as a participant observer to have first-hand experience of the environment ensuring that the observed behaviour is placed in a culturally relevant and meaningful context (Creswell 2013; Fetterman 2010). The narrative approach weaves together a sequence of events usually from just one or two individuals to form a cohesive story. In-depth interviews may be conducted for weeks, months or even years together with studying other documents. (Clandinin and Connelly 2000; Creswell 2013). In a phenomenological study, interviews, reading documents or visiting places and events may be employed to understand the meaning participants place on whatever is being examined. The researcher relies on the participants' own perspectives to provide insight into the phenomenon (Creswell 2013; Moustakas, 1994). Grounded theory provides an explanation or theory behind an event. Interviews and existing documents are used to build a theory based on the data (Charmaz 2014; Strauss and Corbin 1994; Thomas 2013). A case study involves a deep understanding through multiple types of data sources such as interviews, documents, reports and observations. Case studies can be explanatory, exploratory or describing an event and allows investigators to focus on cases such as studying group behaviour, school performance, managerial processes and the like (Creswell, 2013; Thomas, 2013; Yin, 2009). The option to use one and not the other will

depend on what a researcher intends to find out and which of them best suits the purpose of the research.

In considering which type of qualitative research to use for this study, I am considerate of the constructivists' paradigm underlying this research and identify with Schultz's methodological position. Schultz (1967) explains that in the social sciences unlike physical sciences, the researcher deals with research objects (people) who are themselves interpreting the social world (through their interaction with it) which the researcher also wishes to interpret. The researcher must therefore see the world through their eyes, from their perspective and so for this research, EE teachers should be understood from their world or their perspective, from their experience, educational and social background (habitus and capital) and how all that have informed their world view of EE and how they teach it (practice) in colleges of education in Ghana (Field). If EE is not 'seen' the way EE teachers 'see' it (not looked at from their perspective), it would be an exercise in futility to engage them in any meaningful reforms and other curriculum programs to boost their capital and or re-educate or modify their habitus to help them function optimally. According to Yero (2010), it is very important for teachers themselves to reflect on their own thinking and behaviours because each teacher's processes and interpretations are unique, only they can determine what changes might be needed, only they can make those changes happen and so deep and expanded views of the participants on EE is at the center of this research. It is by attending to their divergent experiences and recounts that a greater understanding of teaching EE in Ghana can be achieved and one type of qualitative research that lends itself fully to this kind of research is phenomenology.

6:2:2 Research Design: Phenomenology

The term phenomenology is derived from the Greek word *Phainomenon* which can be interpreted as Appearance. The essence of phenomenology was to challenge the Cartesian

philosophy that was clearly objective, empirical and positivist. Phenomenology is attributed to the works of Edmund Husserl and later Martin Heidegger a student of Husserl who expanded on Husserl's work. Theories of Husserl and Heidegger were later expanded by other phenomenologists.

Phenomenology is a broad discipline and method of inquiry which started as a philosophical movement and focused on the nature of experience from the point of view of the person experiencing the phenomenon, which is usually referred to as "lived experience" (Connelly 2010; Kvale 1996). It studies human experience and the ways in which things present themselves to individuals in and through those experiences (Sokolowski, 2000; Spinelli 2005; Smith, 2008). That is, identifying the life world of an individual and the relation between consciousness and objects of knowledge with an emphasis on the objects. (Barnacle, 2001; Langdridge 2007; Smith, Flowers and Larkin, 2009). This is what is usually referred to as "back to the things themselves" (Husserl, 1931), which means back to the way things were given in experience of the participants.

Transcendental or descriptive phenomenology which was employed in this study holds promise as a viable procedure for phenomenological inquiry. Moerer-Urdahl and Creswell (2004) argue that although this approach to phenomenology may appeal to those in psychology, it is widely used in the social and human sciences. The focus is the correlation of the *Noema* (what is experienced) and the *Noesis* (how it is experienced) (Smith *et al*., 2009). Transcendental phenomenology is less focused on the researcher's interpretation compared to hermeneutic phenomenological approach. It is more focused on describing experiences and on one of Husserl's concepts, *Epoche*, a Greek word meaning to stay away from or abstain in which the investigator's experiences are set aside as much as possible to allow for a new or fresh perspective to be taken of the phenomenon under examination (Moustakas, 1994). In this

sense and according to Moustakas (1994, p.34), transcendental will be taken to mean "in which everything is perceived freshly, as if for the first time". Moustakas admits that this state is seldom perfectly achieved but explains that researchers aim towards this objective when they begin a project describing their own experiences with the phenomenon and bracketing out their views before proceeding with the experiences of others. Sanders (1982, p. 354) opines that "Phenomenology seeks to make explicit the implicit structure and meaning of human experiences". This provided insight of significant magnitude into this rather uncharted area of study in Ghana's EE discourses. The robustness of phenomenology lies primarily, in the emergence of descriptive data of a phenomenon that is meaningful to the research participants (Atkinson, 1972 in Sanders, 1982) and "by adopting a strictly descriptive approach, (as was done in this research) we can let phenomena speak for themselves…" (Giorgi 1985, p.151).

6:2:2:1 Philosophical Assumptions for Phenomenology

There are a set of beliefs and philosophical assumptions which inform research. Hitchcock and Hughes (1995) explains that ontological assumptions (assumptions about the nature of reality and the nature of the world or things) gives rise to epistemological assumptions (ways of researching and enquiring into the nature of reality, the nature of things and how knowledge claims are justified) this in turn informs the methodological considerations and from these, types of instrumentation and data collection approaches. Axiology which considers the values of beliefs we hold (and the role these values play in research) is also considered (Cohen, Manion and Morrison, 2002). The ontology guiding this research embrace the idea of multiple realities and report on these multiple realities by exploring multiple forms of evidence from different individuals' perspectives and experiences. Evidence of this is seen in themes generated from the participants' narratives and the use of actual words of participants to reflect their different or similar perspectives in chapters 7 and 8. On the matter of axiology, although all researchers

bring value to their study, researchers operating within the constructivists' paradigm and making use of qualitative methods acknowledge the value-laden nature of information gathered and actively report their values and biases by bracketing (Creswell, 2012). The epistemological consideration for this study was that data on EE in colleges of education could be found (although not limited to) within the experiences and perspectives of the teachers and as such provided insights into their motivations and actions as well as their assumptions (Lester, 1999) and perceptions of the phenomenon.

6:2:2:2 Bracketing in Phenomenology

Bracketing is a method used by some researchers to counter the possible effects of unacknowledged preconceptions and biases related to a research and by so doing increase the accuracy or thoroughness of the project (Giorgi 1998; Tufford and Newman 2010). There have been divergent views by authors and researchers on who brackets, methods of bracketing, and its timing in the research process (Giorgi 1998). Glaser (1978/1992) advocates that bracketing should be done at the start of the research endeavour whereas Giorgi (1998), advocates that it be limited to the analysis or rather the data explication stage of the research and not during the process of interviewing. As he explains, engagement with the participant takes precedence over holding preconceptions in abeyance or suspension. Yet still, other researchers (Chan, Fung and Chien, 2013; Rolls and Relf, 2006), maintain that bracketing be done at the inception of the research and carried throughout the whole research process. In this research, I allowed the bracketing process to be initiated at all aspects of the study where my biases were likely to chiefly affect; the data collection process and the data explication stages. Chan *et al.* (2013) advocate that, data collection and explication process be done before carrying out the literature review, their reason being that foreknowledge of theories and findings could influence the data analysis process. While I understand that literature review, data collection and analysis

processes are connected and hence realise the concern of these authors, I needed to review literature to be able to have a grip on the research subject (EE) not only to formulate my research questions (Thomas, 2013), but also guide the construction of questions for the interview schedule (Rabionet, 2011). Again, the process of data interpretation employed in this research was robust enough to bring out the 'voice' of the participants and the bracketing process employed therein could 'contain' any influence of such nature to the barest minimum.

6:2:2:3 What is Central to Phenomenology?

Although Heidegger's hermeneutic phenomenology followed Husserl's descriptive phenomenology in time, it did not diminish the value of descriptive phenomenology as a means of identifying essences of human experience or supersede the earlier approach (Sloan and Bow 2014). Heidegger argues that a researcher cannot be removed from the process of essence-identification or remain neutral since the researcher existed with the phenomena and as such the essences and would be required to bear that in mind during the phenomenological process. Although this is seen by some as a point of departure of Heidegger from Husserl (Smith *et al.* 2009; Langdridge 2007), I see it differently. I think it is for the same reason (that the researcher has existed with and may have knowledge of the phenomenon under study) that bracketing is done. So Instead of just 'bearing it in mind' (as in hermeneutic phenomenology) it is written down (in descriptive phenomenology). For, if what is borne in the mind of the researcher influences the data to the extent that it forms parts of its meaning, then it is the meaning or part meaning from the researcher that forms part of the research outcome. Although the interpretation of the texts from the participants and subsequent description may take the language of the researcher, it should as a matter of importance retain the 'voice' or meaning of the participants. If this holds true for both hermeneutic and descriptive phenomenology, then there may not exist a substantial difference among the two but a matter of preference on how

one intends to work with the data. In fact, there is a centrality to phenomenology whether one decides to align with Husserl or to Heidegger. Both sought to unearth human experiences as it is lived ((Langdridge, 2007; Laverty 2003) with respect to a phenomenon. It will therefore follow, that no matter which phenomenological methodology is chosen (descriptive or hermeneutic), the phenomenological focus on experience is key. The element of experience from participants or subjects of research strikes a chord with both the paradigm of constructivism which anchored this study, as well as the concepts of Bourdieu's habitus discussed in chapter 4 of this study.

6:3 Methods

This section explains how data was collected and worked on. In the sections that follow, the data collection instrument is described as well as the process of data collection. The sampling process, sample (participants), sample size, data explication process, ethical consideration and validity checks of the study are also discussed.

6:3:1 Data Collection Instrument

The data collection process in a phenomenological research is designed with the notion of setting biases aside throughout the collection and interpretation process (Moustakas 1994). Researchers (Bentz and Shapiro, 1998; Kensit, 2000; Thomas, 2013) caution that, the researcher must allow the data to emerge in qualitative research and so, although narratives, observation and aesthetic expressions (as found in art, or poetry) are regularly employed research methods, one good way of allowing data to emerge in research is through interviews (Kvale and Brinkmann, 2009; Wilson, 2007).When interviews are face to face, Giorgi (2009) explains that they are richer in terms of nuances and depth and thus turn to give an in depth description of the individual's experience as much as possible.

6:3:1:1 Interviews

An interview is "a conversation, whose purpose is to gather descriptions of the interviewee" Kvale (1996, p.174). According to Schostak (2006, p.54), an interview is geared towards having "in-depth information" on issues. Although interviews may be structured, semi-structured or unstructured, all involve the interviewer being in face- to- face contact or telephone contact with the interviewee (Thomas, 2013). For this research, semi -structured interview was used. A semi-structured interview is made up of a series of open-ended questions based on the research topic. Because the questions are open ended in nature, I (the interviewer) and the participants (the interviewees) could discuss issues on the topic in much more detail. The choice of semi - structured interview as an instrument for data collection in this study was appropriate because, such interviews are well adapted for research involving exploration of opinions, perceptions and experiences of a phenomenon or issue (Smith *et al*., 2009). Barriball and While (1994) suggest that, once the participants among other things have different educational backgrounds and individual histories, the use of a standardised or structured interview is excluded. On the other hand, unstructured interviews due to the nature of questioning are likely to generate inconsistencies which makes working with such data difficult in terms of coding and explication (Creswell, 2007). Thomas (2013, p.198) refers to the use of semi-structured interviews as having "the best of both worlds as far as interviewing is concerned" he explains that it provides "the structure of a list of issues to be covered together with the freedom to follow up points as (deemed) necessary". Aside assessing the participants' opinions, statements and convictions, Semi-structured interviews also allows the researcher to elicit narratives about the personal experience of participants (Nohl, 2009).

Some of the most common information usually encountered in literature relating to interviews and which I intend to generally follow in this research include: preparation for the

interview; constructing effective research questions (interview schedule), and actual implementation of the interview (Creswell, 2003/2007).

6:3:1:2 Constructing the Interview Schedule

In developing the questions for the interviews and follow up probes, I needed to have a good grasp of the subject of this research, EE. This I did by reading literature and previous research done in EE (Rabionet, 2011) and relying on knowledge I had previously and from my practice of teaching. To get the best out of semi-structured interviews, researchers (Smith *et al*., 2009; Thomas, 2013) suggests that an interview schedule should be developed to ensure that the interviewee provides detailed account of what the interviewer seeks because a schedule facilitates a "comfortable interaction with the participant" (Smith *et al*., 2009, p.59). But the schedule is not a rigid procedure to be followed and one should be flexible since the guide only serves the purpose of reminding the interviewer what needs to be covered (Thomas, 2013) and so its purpose was to initiate the discussions and guide it.

Some authors (Kvale, 1996; Smith *et al*., 2009; Thomas, 2013) have addressed some important things to consider in constructing questions for interviews. Thomas and Smith *et al.* suggest that one should look at the research question and construct sub questions which when answered by the research participants, provide an opportunity for the research questions to be answered. Following this, sub questions were formulated from the research questions and possible follow up questions and probes were constructed (see appendix B). From these, the schedule or guide for the interview was developed. The interview guide was useful during the interviews because it allowed me to remain in the "driver's seat" (Turner 2010, p. 755) and in 'control' of the interview process so that I was not swayed from the focus and purpose of the interview and research.

McNamara (2009) also identifies the following in relation to interviews which were very

useful, they include the following; wording should be open-ended so that respondents feel comfortable using their own words to answer questions; questions should be asked one at a time, so that respondents can organise their thoughts and be clear in their response; questions should be worded clearly; questions should be as neutral as possible, judgemental words that sought to influence answers were avoided, for example, 'don't you agree that environmental education is important?' According to Barbour and Schostak (2005, p. 43), "the shorter the interviewer's questions and the longer the subject's answers, the better an interview is". Questions were therefore as short as possible, while still containing the relevant words that sought to bring out information the researcher requested from the participant. In a general way, the interview guide provided a kind of 'uniformity of questions asked' so that differences in the answers were due to differences among the respondents' experiences, perceptions and perspectives of the issues and not due different questions asked.

In developing the instrument, I discussed the instrument with colleagues and my supervisor for feedback (Smith *et al*. 2009). For this research, there were two interview guides; 'C1' outlined how the interview will proceed and 'C2' contained the interview questions (see appendix C1 and C2). Once the schedule was developed, I tried to study it in advance and get accustomed to it as much as I could to avoid unnecessary distractions during the interview process. According to Smith *et al*. (2009), interviewees can be distracted if the interviewer keeps flipping or referring to the schedule every now and then or trying every now and then to remember the stage at which the interview is, or which question should be asked next. The pilot interview helped me get acquainted with the schedule questions and prompts for the actual interviews.

6:3:2 Piloting

I did a pilot interview to help improve my instrument in content suitability and how easily

participants understood the questions or not from answers they gave. It also gave me the opportunity to check on my voice tone and if the language used sounded respectful enough or if participants felt disrespected or offended by the language I used and or the depth of information I needed. The pilot study was conducted with two participants of similar characteristics as those that were used in the actual study. They were EE teachers in colleges of education in Ghana which were not part of the sample selected. This process helped me to detect flaws in the instrument and interview process and address them (Thomas, 2013; Rabionet 2011; smith *et al.* 2009; Creswell 2009; Kvale, 1996). During the piloting, I noticed for example that in responding to one question, sometimes a participant answered another question and so there was no need to ask that same question again when I came to it. Unless in cases where it was not fully answered, and, in such instances, I rephrased the question to get more details or details omitted in the initial answer.

6:3:3 Study Participants

Creswell (2007) discusses the importance of selecting appropriate candidates for interviews. He asserts that the researcher should utilize one of the various types of sampling strategies to obtain qualified candidates that will provide the most credible information to the study.

6:3:3:1 Sampling Method

In choosing participants for this study, I identified purposive sampling, considered by Welman and Kruger (1999) as the most important kind of non-probability sampling. I selected the sample based on my judgement and the purpose of the research (Greig and Taylor 1999; Schwandt 1997; Babbie 1995) and looking for those who "have had experiences relating to the phenomenon to be researched" (Kruger 1988; p.150) or are 'information rich' with respect to the phenomenon under study.

6:3:2:2 Sampling Procedure

The colleges of education (CoE) in Ghana are put into five administrative zones (Northern, Ashanti - Brong Ahafo, Central -Western, Accra – Eastern and Volta). The sampling technique I used is what I term as 'Random - Purposive - Random Sampling' (RPRS). First, I **randomly** selected one college from each zone using the lottery method and so five colleges, one from each zone was picked. The sampling was **purposive** in nature because in CoE in Ghana, EE is taught as part of Science and Social science courses and so only tutors of these subjects embodied with such experience qualified as participants for this research. Once the colleges were selected, the researcher made contacts with the heads of departments (HODs) for science and social studies in these institutions through former colleagues (more like snowball sampling but those contacted in this case were not the participants). Through the HODs, the list of names of all teachers teaching science and social studies (which ranged between two to five teachers for each separate course) in each of the five college were compiled. I then **randomly** picked one science teacher and one social studies teacher from each college again through the lottery method.

Once the list of selected teachers was compiled, I made the first contact through phone calls (phone numbers gotten from HODs). In three cases, the participants picked were the HODs themselves. I introduced myself and explained the purpose of the call, the research and asked initially if they will be interested. For some of the teachers, the answer came quickly, others asked few questions and then gave their response, but generally all of them were interested in taking part in the research. Over a period, lasting 3 weeks, request letters to participate in the research were sent out through post and personal delivery together with an information sheet, consent form (appendix A) and demographic survey questions (see appendix C). None of the invitations was declined, all participants confirmed their initial interest to participate in the

research via phone or text message. Following this, I contacted participants through phone calls to schedule a date for an interview. In some cases, although participants stated they were interested, up to five or six phone calls were made at different times before a date for the interview could be fixed.

6:3:2:3 Sample

For a phenomenological study, Creswell (2009) suggests up to 10 participants for interview while Boyd (2001) regards two to ten participants as sufficient. Polkinghorne (1989) recommends five to twenty-five individuals and Giorgi (2009) recommends at least 3 participants. In considering the 'right' number of participants to use in qualitative studies involving interviews, Englander (2012) argues that of importance is the in-depth knowledge of the content of experience a research seeks to find the meaning of a phenomenon and not the number of participants. He however concedes that a higher number of participants sharing their experience will result in better appreciation for variation of the phenomenon. I settled on 10 participants made up of two teachers (one science and one social studies) from each of the five colleges who became primary units for data acquisition (Bless and Higson-Smith, 2000). In this way each zone was represented.

6:4 Demographics of Participants

The ratio of males to females was 6:4, not that gender played a role in strengthening or weakening the findings or sections of it in this research (or at least, this research did not seek to investigate this). It probably would not have mattered if participants were all male, all female or were of other forms of sexual orientation, once they were embodied with experiences pertaining to the phenomenon under study, it sufficed for this research. Nonetheless, the blend shows a kind of heterogeneous representativeness in terms of gender inclusiveness, at least in the two widely accepted gender orientations in Ghana currently. There was also a balance in

Table 6:1 Summary of Participants' Demographic Data

Key: ES = Environmental Science, EE = Environmental Education, HoD = Head of Department, SS = Social Studies, EMP = Environmental Management and Policy, CoE = College of Education, Curr. = Curriculum.

	Bob	**Jane**	**Josh**	**Ray**	**Frank**	**Milli**	**Aha**	**Connie**	**King**	**Vera**
Gender	Male	Female	Male	Male	Male	Female	Male	Female	Male	Female
Course taught at CoE	SS	Science	Science	SS	SS	SS	Science	Science	SS	Science
Academic rank and appointment	Tutor HOD	Tutor	Tutor	Tutor HOD	Tutor HOD	Tutor	Tutor	Tutor	Tutor	Tutor
Undergraduate degree	B.Ed. SS	B.Ed. science	B.Ed. science	B.Ed. SS	B.Ed. SS	B.Ed. SS	B.Ed. Science	B.Ed. Science	B.Ed. SS	B.Ed. Science
No. of ES / EE related courses	6	7	6	5 - 6	4	3 - 4	8	5	6	7
Master's degree	M. Ed. SS	M.Phil. ES	MSc. ES	M.Phil. Curr. Studies	M.Ed. SS	M. Ed. SS	-	M.Ed. Science Educ.	M.Phil. Curr. Studies	MSc EMP
No. of ES / EE related courses	3	-	3	2	2 - 3	1 - 2	-	-	2	3
Years of teaching in CoE	6	13	10	13	11	12	5	9	13	6
Self-rated proficiency in teaching ES/EE	Expert	Very good	Very good	Very good	Expert	Good	Very good	Very good	Very good	Very good

terms of the courses taught by participants, five participants were Science teachers and five were Social Studies teachers. Again, I am not so sure if findings would have been affected had more of the participants come from one-course area. But as indicated earlier, these are the two courses into which EE is mainly integrated and having a balance will seem fair to the representation of experiences and perceptions on EE.

Participants years of teaching in CoE ranged between five and thirteen with most participants (seven out of ten) having over nine years of teaching experience and three participants doubling as HODs. In terms of educational qualification, all respondents had Bachelor of Education (B.Ed.) in either Science or Social Studies and a master's degree in Environmental Science, Science or Social Studies related areas and hence were all qualified to teach at the CoE and in such capacities as they taught. Number of courses related to EE which participants studied at the undergraduate level ranged between three and eight with eight participants indicating they read about five or more courses in environmental related fields. This was significantly reduced to between one and three courses at the master level even for participants who read programmes like Environmental Management and Policy and Environmental Science. There was not much difference between number of EE-related courses for participants who read Social Studies and those who read Science related courses both at the undergraduate and masters' level. On a scale of one to five (1 – 5) on self-rated proficiency in teaching ES/EE (1 = novice, 2 = good. 3 = quite good, 4= very good, 5 = expert), participants rated themselves between good and expert. Most of the participants (seven out of ten) indicated they were Very Good, two rated themselves as Experts while one indicated Good. See table 6.1 for details of the demographic data.

6:5 Conducting the Interviews

"There are many books with advice on how to conduct an interview, but none happens to be written with explicitly phenomenological criteria in mind" (Giorgi 2009, p. 122). It will

therefore follow that, there are no such interview guidelines designed specifically from a Husserlian phenomenological perspective or considerations and so in the absence of such, the general rules on qualitative interviewing was referred to in this research.

During the preparation for the interviews and in conducting the interviews, guidelines outlined by some researchers (Creswell 2009; Kvale 1996; McNamara, 2009; Mishler 1986; Richards, 2003; Smith *et al*., 2009; Thomas 2013) were considered and applied.

McNamara (2009) applies eight principles to the preparation stage of interviewing which include; choose a venue with little distraction; explain the purpose of the interview; address terms of confidentiality; explain the format of the interview; indicate how long the interview usually takes; tell them how to get in touch with you later if they want to; ask them if they have any questions before you both get started with the interview and do not count on your memory to recall their answers. Richards (2003) suggests that an appropriate atmosphere should be sought to make the participants feel more at ease and thus talk freely. Each participant was given the opportunity to choose the venue of the interview (Smith *et al.,* 2009). All the participants in this study chose locations within the colleges where they taught. Some of the venues included offices, classrooms and under tree sheds, but most of the interviews (seven out of ten) were in offices and classrooms which were not in use. All the locations at the time of the interviews were generally quiet and free of destructions and interruptions (McNamara 2009; Smith *et al*. 2009).

In accordance with the 2nd - 6th principles of McNamara (2009) and also in line with suggestions by other researchers (Thomas, 2013; Creswell, 2009; Smith *et al*., 2009), the purpose of the interview was explained to participants before the actual interview. An information sheet was given to each of the participant at least 3 days to the interview. On the information sheet, I introduced myself and my supervisor and explained the purpose and nature

of the research, what will be required of the participant and data security measures taken. It also addressed issues of confidentiality, risks, voluntary participation and how the University of Birmingham, my supervisor and I could be contacted. Attached to this was an invitation to participate in the research and a consent form (see appendix A) to be signed by the participant if he or she chose to take part. The seventh principle was addressed during the interview as participants were asked if they had any questions before the interview started. To address the 8th principle which cautions the interviewer not to rely on his or her own memeory, the interview was audiotaped (with participants consent), and a field dairy kept.

Barbour and Schostak (2005) state that the interrelated power within an interview whether intended or not has the tendency of emerging from the interviewer's side towards the participant. To avoid this as much as possible, I dressed as a teacher would, being a teacher myself. I asked questions in a respectful tone as much as I could and desisted from body language that could suggest anything to affect the participants' responses. I noted that as the interview extended the participants became much more comfortable and spoke with much ease and more detail. At this point and in cases where the participant had earlier given scanty information on an issue, I went back to such issues and asked for further description of details (Rubin and Rubin 2005). One question was asked at a time so that participants were not 'jammed with a traffic 'of questions and which also gave the researcher time to write down notes when necessary. The tape recorder was check to see if it was functioning well before the start of the interview and intermittently during the interview process. There was a green light at the side of the recorder which indicated the tape was in recording mode. Occasionally, I encouraged participants' responses by nodding to indicate they were being listened to and understood. Phrases such as "okay" "I understand" "uhuh!" were occasionally used to encourage participants to give a full description of their experience as much as they possibly could (McNamara, 2009). It also indicated to the

participant that I was interested in what they were saying. Asking follow-up questions during the interview proved useful in getting more insights and information. Adapting the pre-constructed questions gave me the opportunity to explore a more personal approach with each participant (Turner, 2010) and break the monotony of asking same questions interview after interview. This was not easily done at the beginning of the first interview but as the interview travelled on and in subsequent interviews, it became much easier to do this. McNamara (2009) observes that when the interviewer jumps to take notes on a response given by a participant, it may indicate an element of surprise or being pleased by the answer which may influence answers to further questions. To avoid or at least minimise the occurrence of this, note – taking was generally done at the end of each interview session. Otherwise if it was important to make such notes during the interview process, it was done with the 'flow of the interview' without jerking to take notes and without any expressions or comments. During an interview, participants were alerted when I was moving to talk of a different topic. For example, I would say "…can we move on to talk on 'this topic'" and thus, a smooth transition was done when the researcher needed to "pick up a new thread" (Smith *et al*. 2009, p.64).

At the end of each interview, I gave each participant the opportunity to bring up comments, clarify or ask questions (Talmy, 2010) and thanked each of them for their time and effort. Participants were also informed that a copy of their transcript would be emailed to them for review and clarification purposes and that they may be contacted should there be need for further clarification on answers given. Participants were reminded to contact the researcher if they needed to add, clarify, exclude information given or exclude themselves from the research. After each interview, I checked to ensure the whole interview was recorded. This was done by a series of 'forward - listen - rewind- listen' in no orderly or timed fashion, but making sure that opening remarks of the interview, some mid -portions of the interview and the concluding

portions were heard and that the voice quality was good. In order, not to mix up recordings and to give participants identity, each participant was given a random name. Names were used to identify each participant's interview and transcript and any notes made on participants during interviews. All participants were interviewed within eight weeks and even though the estimated time for each interview was 40 minutes, interviews were between 35 – 56 minutes.

On using interviews in research, I do agree that recounting experiences which are based on participants' memory and given reports of same may contain a degree of inaccuracy, since such recounts are always subject to memory degeneration, modifications and possible faults in responses or response errors (Giorgi, 2009). However, information given by participants could be relied on as adequate data since they still contained descriptions of participants perceptions and 'meanings' concerning the phenomenon (Giorgi 2009; Giorgi, 2012) which were explicated into meanings which participants can identify with.

6:6 Ethical Consideration

Ethical considerations are important in research involving human participants (Cohen, Manion and Morrison, 2007; Thomas, 2013). Ethical clearance was first sought from the University of Birmingham. Some ethical considerations were earlier mentioned during the preparatory stage for the interview and the actual interview process such as seeking participants consent and furnishing participants with information on the research (Holloway, 1997; Kvale, 1996) and thus, any form of concealment or possible deception was avoided (Bailey, 1996; Thomas, 2013) as this research did not warrant concealing information or deception of participants.

6:6:1 Confidentiality, Data Security and Risks

Participants in a study have the right to anonymity, privacy and confidentiality. True anonymity exists only if a participant's identity cannot be linked to the data, even by the

researcher (Burns and Grove, 2005; Thomas, 2013). To help ensure confidentiality, which is a challenge especially when interviews are involved, I used random names for participants (Thomas, 2013) and removed identifiers that could possibly reveal their identity. For example, if a participant said "…you know my college is in the northern region and here…" such statements were taken out if they did not directly tie into the 'meaning' the participant was making. Also, when names of participants appeared in their answers, for example, a participant will say "……so for me 'X' what I do in the class is to…." The name was taken out. Levine (1981) stresses that, participant information should not be shared at any point in time with others and in any form without their explicit consent. All audio tapes and written data were initially stored in my home computer and desk and locked, limiting access to only me. Further, all data gathered for this project was subject to the data protection policy of the University of Birmingham to ensure maximum degree of confidentiality. No risks were identified and or encountered during this research. The only notable issue was that participants had to give their time and to the extent that they voluntarily did this, this issue was addressed.

6:6:2 Voluntary Participation and Withdrawal

According to Thomas (2013, p.49), "Participants have to make an active choice about becoming involved and signal their willingness to take part in the research". Participation in this research was voluntary, participants were informed orally and on the information sheet of their right to withdraw at any time with no consequences whatsoever. However, there was no indication before, during and after the interview from any of the participants of their intention to withdraw or have portions of their interviews expunged.

6:6:3 Ensuring Validity

Most commonly heard criticisms of qualitative research of any kind according to Pope and May (1995) are in three folds; that qualitative research is subject to researcher bias (also see

Kahn, 2000); that qualitative research lacks reproducibility and that outcomes cannot be generalised as it generates large amounts of detailed information from a small number. On the issues of researcher bias, bracketing has been suggested as a way of not allowing or minimising the effect of the researcher's bias influencing research outcomes (Moustakas, 1994). The advantage in a qualitative research is that influences which are likely to affect results are recognized and steps are taken to as much as possible lessen their effects on data collection and further work on the data (Polkinghorne, 2005) this was done through adherence to the methods and procedures, sampling techniques and keeping an audit trail during data explication. On reproducibility of findings, I ensured the rigour of the data collection and explication process to make findings acceptable, credible and transferable (Sandelowski, Barroso and Voils 2007). I presented the account of methods used in this research such that another trained researcher could analyse the same data in the same way and come to essentially the same conclusions. Each transcript of the interview sessions was given back to the participants for verification purposes before the 'proper' data explication process. Investigator triangulation technique (Denzin, 1978; Denzin and Lincoln, 2003) was used, in which multiple researchers were invested in the research especially with developing the research instrument and during the data explication process. For this research, Bariham Iddrisu a Doctoral student at Kenyatta University, Nairobi, Kenya and Gordon Yakpir a Doctoral student at the University of Birmingham, served as investigators through which the data explication process was triangulated. They were given samples of randomly chosen transcribed text, themes they got out of these were compared with mine. Discussions were made on such areas where the themes differed to come to an agreement on common themes without compromising the 'sanctity' of the data. On generalisability of results, it must be noted that in qualitative research in general and specifically phenomenology, the idea is not to generalise but to have an in-depth description

of the issues under study as experienced by the participants. So, 'digging deep' is the preferred option to 'scraping wide' and every 'voice' matter.

Data in this kind of research has its limitations, one of such being that human experience depends on the ability of the participant to reflect and bring out the experience to bear on what is being asked. But this limitation also holds true in quantitative methods of research because a participant answering a questionnaire for example or given statement (s) with which to 'agree' or 'disagree' by placing a numerical value on their thoughts or translating their thoughts into numeric language, also rely on memory and so it should suffice that participants can recount their experiences and state perceptions they hold about the subject.

6:7 Data Explication Process

As Mohanty (1984, p.117) noted, for Husserl "being given (as was done during the interview) and being interpreted (as was done during the data explication and discussion) are descriptions of the same situation from two different levels of discourse". Thus, there are both descriptive and interpretive moments in descriptive phenomenological method, but the researcher is careful to deal with each in exclusive ways. Many authors (Collaizzi 1978; Creswell, 2012; Giorgi, 1979; Holloway, 1997; Hycner 1999; Moustakas, 1994; Munhall, 2007; Polkinghorne, 1989; van Manen, 1997) have stated that in phenomenology, data should be allowed to emerge to take on its own form or tell its own story, because "imposing a method on a phenomenon will do a great injustice to the integrity of that phenomenon" (Hycner 1999, p.143/144). However, it is necessary to consider some guidelines in the data explication process. Phenomenological research literature (Collaizzi 1978; Giorgi, 2009; Hycner, 1999; Munhall 2007; Polkinghorne 1989; van Manen, 1997) describes several of such guidelines for working with data to come up with results. Although these guidelines are generally the same, I chose to use the approach by Giorgi (1985) simply because it draws from Husserl's philosophical

principles which this research identifies with, but also, with an adaptation of a simplified version of Hycner's (1999) data explication process because it not only draws on Giorgi's method of data expliication but has been used in educational research (Groenewald, 2004; Kimaryo, 2011). Guidelines for working with data as outlined by Giorgi (1985 /1989/ 2009) and those of Hycner (1999) which include; bracketing and phenomenological reduction; delineating units of meaning; clustering of units of meaning to form themes / summarising each interview, validating it and where necessary modifying it; extracting general and unique themes from all the interviews and making a composite summary, were thus adapted for this study.

First, I had to bracket and remain in a phenomenological attitude, which is "in a sense that regard no position is taken either for or against" (Lauer, 1965, p. 49). I transcribed the interviews word for word as I listened to sections of the interview from start to finish. I listened, wrote down what was said and played it back to ensure the correct words were written (Giorgi, 2009; Giorgi, 2012; Hycner, 1999). Communication researcher Linell (1998) explains that, a transcription always entails an interpretation of the interview situation. Again, in phenomenology every detail which will constitute the 'essences' of individual's experiences is of importance and so care was taken at this and subsequent stages of the data explication process not to lose 'words' of participants which could affect their text meaning. This process was extremely slow as I had to go back and forth to ensure that what was written for each participant was what the participant said and not what I wanted to hear them say, think they said or should have said. After the transcription, I played back the whole interview while following what I had transcribed to ensure every word was captured.

Following this, some editing of the text was done. It must be stated that this stage of editing did not change the structure of the initial interview, it only eliminated redundancies (Giorgi, 2009; Hycner, 1999). Repetition of words that did not connote emphasis nor affected the

meaning of a text were removed. For example, if a participant said "…and in most cases, I use my own money, I mean money from my own pocket, to…." (Bob: 34), it connoted emphasis and was left to stand as it was, especially when field notes from such a participant suggested such. But a statement like "…they need to learn about erm! What do you call it? What do you call it? conservation" (Jane:8), was edited to read "…so they need to learn about conservation," since the participant, in this case, was only trying to recall the word conservation by using "erm!" and the repeated use of the phrase "what do you call it?". Where participants used exclamations, laughed, sighed or were visibly angry, these were clearly bracketed as (laughs), (angrily) or the sighing sound was written for example, (Humm!) or (Arhh!).

Some authors on phenomenological methods of research (Creswell 2007; Englander 2012; Giorgi 2009; Polkinghorne 1989) suggest involving participants in an audit process to ensure the accuracy and intentions of their responses and so following the transcription process, an electronic copy was sent to each participant via email and text messaging. I then called each participant to make sure they were in possession of the transcript and explained the purpose. Via e-mail, text messaging and telephone, participants initial comments on the text were taken, their transcripts updated accordingly and sent back to them for a final review. Although in some research, validity check may be done after the themes have been summarised (Groenewald, 2004), I decided to do the validity check with the initial transcripts to avoid the situation where 'unchecked' or 'unapproved' data is worked upon only to realise later that part of the data was not cleared by a participant. I also used this opportunity to make clarification on some answers earlier given. After this process, the transcript for each participant was line numbered as shown in figure 6.1(Giorgi, 2009) to begin the audit trail in the data explication process.

Each participant's transcript was then transferred into a matrix for an initial data explication process. The matrix had four columns; a column for the actual questions asked in the interview;

a column where the line numbered responses were transferred to; a column where the Seme (meaning unit) from the participants' line numbered texts were written and a column for Initial themes generated from the Semes. The semes from participants' actual transcripts were written such that they retained the wholeness of the participants' text meaning and hence retained their identity as part of the participants experience (Polkinghorne, 1989).

I used the same text colours to indicate text from transcripts and semes derived from such text. So, for example, a blue coloured text had the seme (s) derived from it also in blue colour as shown in figure 6.2. This made it easier for me to crosscheck and work with the data and for colleagues who helped in the triangulation and verification process to crosscheck texts and Semes.

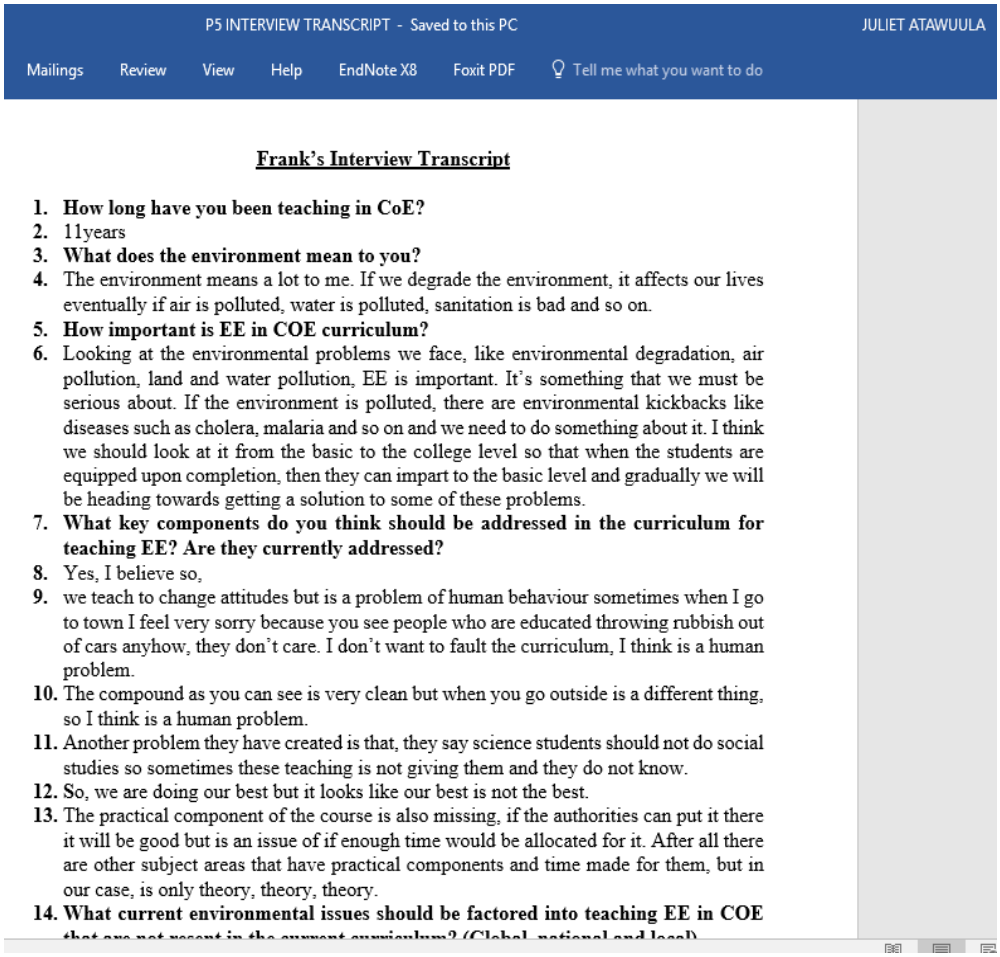
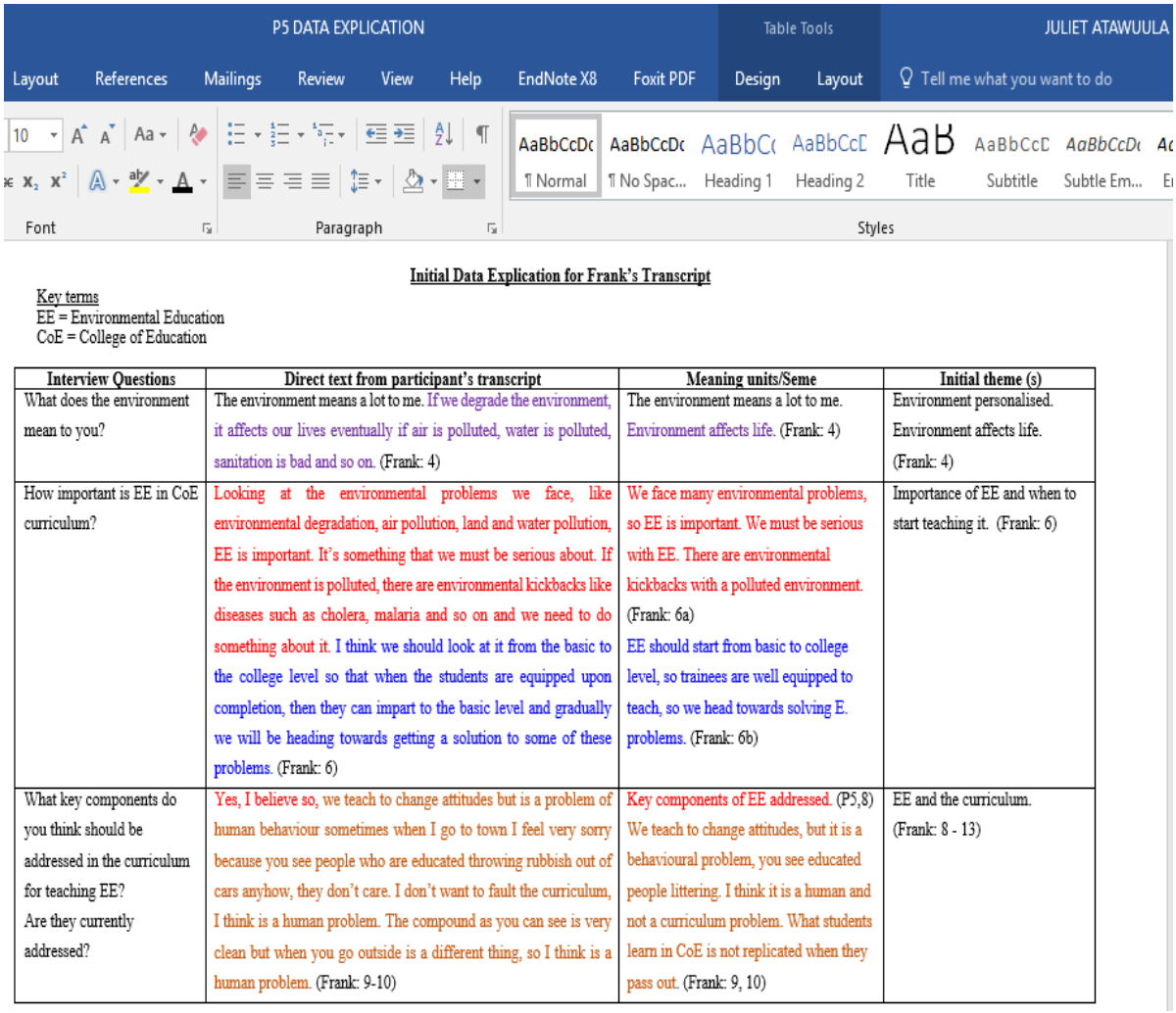


Figure 6. 1: A Screenshot Showing a Participant's Numbered Transcript

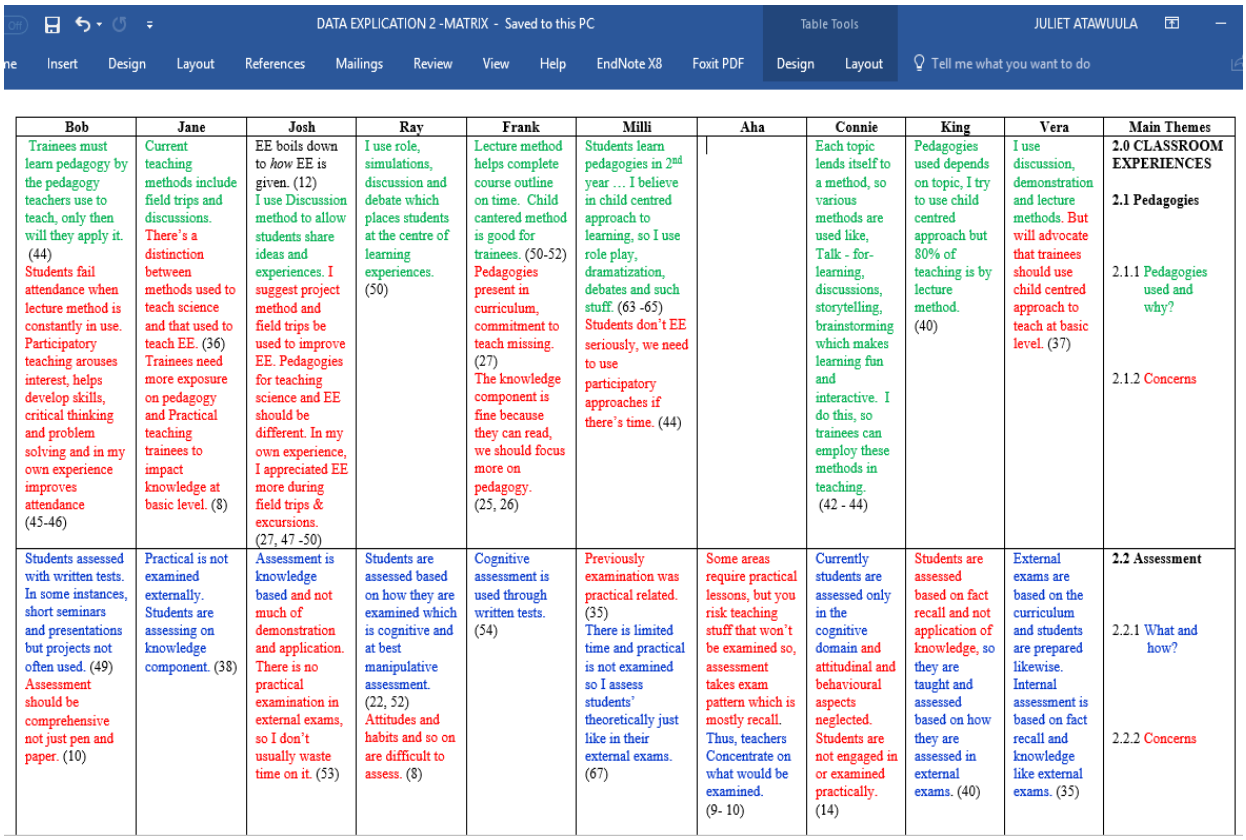


Interview Questions	Direct text from participant's transcript	Meaning units/Seme	Initial theme (s)
What does the environment mean to you?	The environment means a lot to me. If we degrade the environment, it affects our lives eventually if air is polluted, water is polluted, sanitation is bad and so on. (Frank: 4)	The environment means a lot to me. Environment affects life. (Frank: 4)	Environment personalised. Environment affects life. (Frank: 4)
How important is EE in CoE curriculum?	Looking at the environmental problems we face, like environmental degradation, air pollution, land and water pollution, EE is important. It's something that we must be serious about. If the environment is polluted, there are environmental kickbacks like diseases such as cholera, malaria and so on and we need to do something about it. I think we should look at it from the basic to the college level so that when the students are equipped upon completion, then they can impart to the basic level and gradually we will be heading towards getting a solution to some of these problems. (Frank: 6)	We face many environmental problems, so EE is important. We must be serious with EE. There are environmental kickbacks with a polluted environment. (Frank: 6a) EE should start from basic to college level, so trainees are well equipped to teach, so we head towards solving E. problems. (Frank: 6b)	Importance of EE and when to start teaching it. (Frank: 6)
What key components do you think should be addressed in the curriculum for teaching EE? Are they currently addressed?	Yes, I believe so, we teach to change attitudes but is a problem of human behaviour sometimes when I go to town I feel very sorry because you see people who are educated throwing rubbish out of cars anyhow, they don't care. I don't want to fault the curriculum, I think is a human problem. The compound as you can see is very clean but when you go outside is a different thing, so I think is a human problem. (Frank: 9-10)	Key components of EE addressed. (P5,8) We teach to change attitudes, but it is a behavioural problem, you see educated people littering. I think it is a human and not a curriculum problem. What students learn in CoE is not replicated when they pass out. (Frank: 9, 10)	EE and the curriculum. (Frank: 8 - 13)

Figure 6.2: A Screenshot Showing Seme(s) and Initial Themes from a Transcript

The semes from all ten participants were then put in a final matrix guided by significant statements from text and initial themes (Brome, 2011; Creswell, 2007; Giorgi,2012). Next, all semes from 10 participants that centred on the same issue (s) were placed in one section side by side as shown in figure 6.3 below and from here subthemes, themes and main themes were generated. For instance, one such section contained texts from participants on issues bothering on mode of assessment; what is assessed; pedagogies used in teaching and why such pedagogies were used. These became the subthemes, but a closer look at these subthemes showed they clearly fell into two groupings; assessment (which encompassed subthemes mode of assessment and what is assessed) and pedagogies (which encompassed subthemes pedagogies used in

teaching and why such pedagogies were used). Assessment and pedagogies thus became themes in this section. But again, generally looking at the whole of that section which contained the above subthemes and themes, it was observed that participants talked of these in relation to their classroom experiences and so classroom experiences became the main theme. A main theme could therefore be traced back to a Theme which could be traced to a Subtheme(s), and then to seme (s) and to actual text of a participant. This provided an audit trail to ensure that ideas encompassed at the Main theme level which guided the report writing could be traced back to participants own words. Again, same colours were used to mark Semes and subthemes for both easy identification and audit purposes.



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Bob	Jane	Josh	Ray	Frank	Milli	Aha	Connie	King	Vera	Main Themes
Trainees must learn pedagogy by the pedagogy teachers use to teach, only then will they apply it. (44) Students fail attendance when lecture method is constantly in use. Participatory teaching arouses interest, helps develop skills, critical thinking and problem solving and in my own experience improves attendance (45-46)	Current teaching methods include field trips and discussions. There's a distinction between methods used to teach science and that used to teach EE. (36) Trainees need more exposure on pedagogy and Practical teaching trainees to impact knowledge at basic level. (8)	EE boils down to *how* EE is given. (12) I use Discussion method to allow students share ideas and experiences. I suggest project method and field trips be used to improve EE. Pedagogies for teaching science and EE should be different. In my own experience, I appreciated EE more during field trips & excursions. (27, 47 -50)	I use role, simulations, discussion and debate which places students at the centre of learning experiences. (50)	Lecture method helps complete course outline on time. Child cantered method is good for trainees. (50-52) Pedagogies present in curriculum, commitment to teach missing. (27) The knowledge component is fine because they can read, we should focus more on pedagogy. (25, 26)	Students learn pedagogies in 2nd year … I believe in child centred approach to learning, so I use role play, dramatization, debates and such stuff. (63 -65) Students don't EE seriously, we need to use participatory approaches if there's time. (44)		Each topic lends itself to a method, so various methods are used like, Talk - for-learning, discussions, storytelling, brainstorming which makes learning fun and interactive. I do this, so trainees can employ these methods in teaching. (42 - 44)	Pedagogies used depends on topic, I try to use child centred approach but 80% of teaching is by lecture method. (40)	I use discussion, demonstration and lecture methods. But will advocate that trainees should use child centred approach to teach at basic level. (37)	**2.0 CLASSROOM EXPERIENCES** **2.1 Pedagogies** 2.1.1 Pedagogies used and why? 2.1.2 Concerns
Students assessed with written tests. In some instances, short seminars and presentations but projects not often used. (49) Assessment should be comprehensive not just pen and paper. (10)	Practical is not examined externally. Students are assessing on knowledge component. (38)	Assessment is knowledge based and not much of demonstration and application. There is no practical examination in external exams, so I don't usually waste time on it. (53)	Students are assessed based on how they are examined which is cognitive and at best manipulative assessment. (22, 52) Attitudes and habits and so on are difficult to assess. (8)	Cognitive assessment is used through written tests. (54)	Previously examination was practical related. (35) There is limited time and practical is not examined so I assess students' theoretically just like in their external exams. (67)	Some areas require practical lessons, but you risk teaching stuff that won't be examined so, assessment takes exam pattern which is mostly recall. Thus, teachers Concentrate on what would be examined. (9- 10)	Currently students are assessed only in the cognitive domain and attitudinal and behavioural aspects neglected. Students are not engaged in or examined practically. (14)	Students are assessed based on fact recall and not application of knowledge, so they are taught and assessed based on how they are assessed in external exams. (40)	External exams are based on the curriculum and students are prepared likewise. Internal assessment is based on fact recall and knowledge like external exams. (35)	**2.2 Assessment** 2.2.1 What and how? 2.2.2 Concerns

Figure 6.3: A Screenshot Showing a Main Theme, Themes and Subthemes

To demonstrate scientific rigour and trustworthiness in such studies as makes use of Phenomenology, written reports usually offer examples and quotations from the data to illustrate points made, as this attempt to bring readers closer so they can relate to the

phenomenon (Halling, 2002) as well as make clear the evidentiary base of any such claims made in the data explication, report writing, and discussion process. This ensured that interpretations were based on how participants interpreted their experiences and as much as possible in their own words (Yardley, 2008; Smith *et al*., 2009) so their thoughts were represented, and their voices heard all through the explication process.

6:8 Report Writing

In writing the report after the data explication, Verbatim quotes were referenced with participants identity (Bob, Jane, Josh, Ray, Frank, Milli, Aha, Connie, King and Vera) and line numbers of the original numbered transcripts. For example, a quote from Josh taken from the 30th line of his interview transcript was written as (Josh: 30) at the end of such a quote and (Josh 5-8) if the quote was taken from the fifth to eighth lines. The writing of the report followed the format given below so that, a brief overview of the main theme with its theme(s) and subthemes could be easily gleaned before presenting the actual written report.

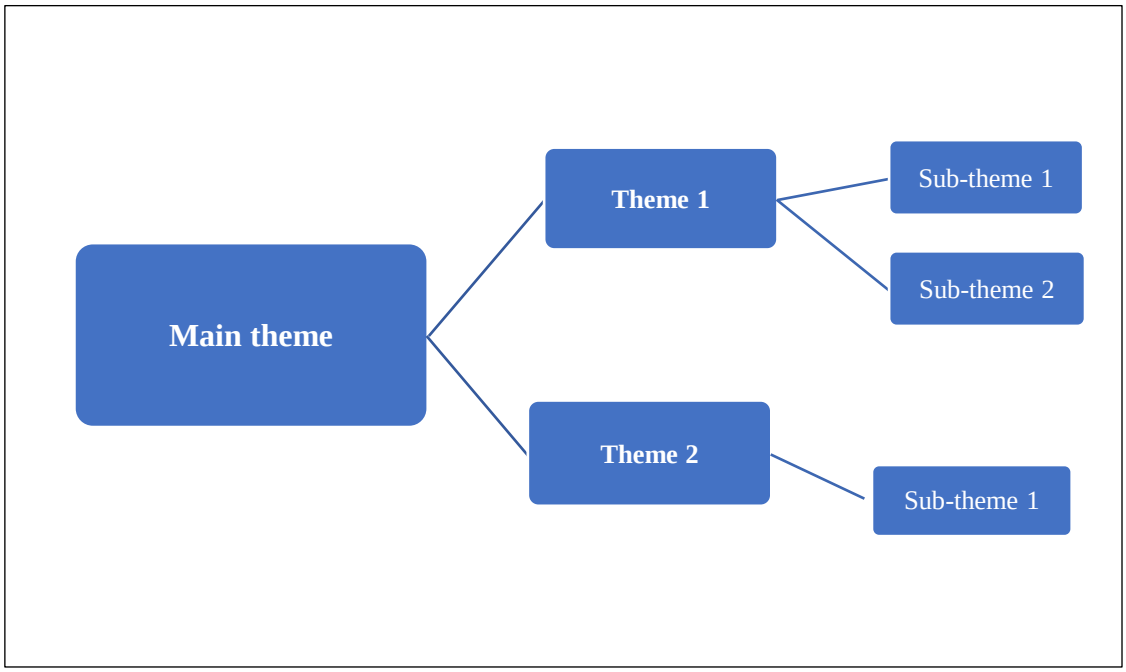

Figure 6.4: Report Writing Format

CHAPTER SEVEN

RESULTS I

Ten teachers of environmental education (EE) in Ghanaian Colleges of Education (CoE) were purposefully sampled and interviewed. This chapter and the next presents result from the data explication of participants' interviews. As indicated in the research questions which guided this study, participants' experiences and perceptions on EE were reported. There were four main themes that emanated from the data explication process, these were; personal experiences; classroom experiences; perception of the curriculum; perception of the environment and environmental education. This chapter reports on participants' personal and classroom experiences, chapter eight reports on participants' perception of the curriculum, the environment and environmental education.

7:1 Personal and Classroom Experiences

This section reports on participants' personal and classroom experiences. This Included experiences from home, school and the wider community as well as their professional training and competence to teach, whereas classroom experiences included their experiences with pedagogies, assessment and how their previous experiences related to teaching of EE.

7:1:1 Main Theme One: Personal Experiences

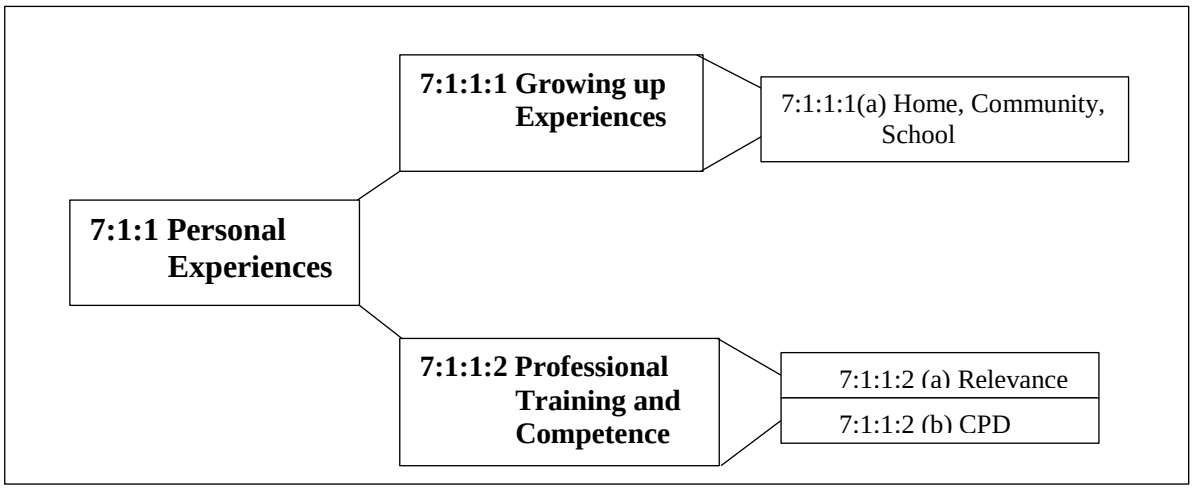

Figure 7.1: Themes and Subthemes on Personal Experiences

This main theme encompassed participants' personal experiences with the environment through their developmental years. It included their recount of where they had an encounter (s) with and learned about the environment, how they experienced the environment and EE and related to it thereof. It also included findings made on participants' professional development and how that related to their preparedness or otherwise in teaching EE.

7:1:1:1 Growing up Experiences

This theme covered experiences participants encountered growing up in relation to the environment. It included places they identified where education on the environment was received, in what form it was received and from who it was received.

7:1:1:1 (a) Home, Community and School

All respondents indicated that their early encounter with EE or at least forms of it occurred in three settings; home, school and community. At home, such education came from parents and relatives and was in the form of storytelling, environmental cleanliness, farming activities, education on personal hygiene, etc. At the community level, it was mainly through exploring the environment with friends and keeping environmental laws and practices as well as participating in communal activities such as town cleaning and tree planting. In school, such experiences were encountered through lessons and activities such as cleaning, tree planting as well as exploring the environment with friends. Here are what some participants said;

> "…I was made to appreciate the environment as a child growing up and I understood the benefits we get from the environment. We had a lot of produce from the environment and heard a lot of stories about sacred forests, days of rest and so on, we were engaged with the environment in all areas, at home, school and community…" (King: 56)

> "At home, it was about keeping the environment and yourself clean. I helped my parents on the farm. At school, I learned about the environment in a lesson taught on the environment. I related to the environment in that we planted trees and took part in communal labour and cleaning the school compound. Also, at playtime at home and school with friends, we hunted for little animals, picked fruits …" (Bob: 53)

> "Growing up I learned about the environment from my parents. I was told from time to time about the environment. We had some plants (mango, plantain and some other trees) in front and behind our house. My grand mum wanted to get rid of those plants so that she can do an extension of the house, but my grandpa never liked the idea. My Grandpa said he won't agree because he believes that the trees were giving us shade, fresh air, and protecting the land so he never permitted that…" (Jane: 42)

> "We heard stories like, if you plant an *Arbor tree,* you will live long like the tree and will get more air and rainwater to drink…." (King: 47)

Participants also talked about having a relationship with the environment and keeping traditional laws that protected the environment. They did indicate that the consequences of not keeping such laws were motivation enough.

> "You know these Gods, sanctuaries and other environmental stories we heard growing up, helped us to preserve the environment… My friends and I hunted for fruits and were told stories about how important it was not to violate laws like not fishing and or farming on certain days and respecting and not cutting certain trees in the community" (Milli: 71)

> "We were involved with and had a relationship with the environment and were afraid to break environmental laws because of the repercussions. Together with friends, we had our own adventure with the environment…tree climbing, fruit picking, farming, and small animal hunting and so on…." (Ray: 6a)

> "We respected the traditional environmental laws because breaking them had grave consequences some including death and diseases…" (Frank: 56)

It is worth noting from the narration of Josh below that punishment for breaking environmental laws was not only limited to the home and community but also attracted corporal punishment in school when such laws were broken or not adhered to within the school environs. So, for example if there was a sacred grove near the school, students were not allowed into it in line with the demands of the community and thus environmental laws in the community were reinforced within the school setting. Both the community and family served as watchdogs to protect the environment which was to be treated with care and respect.

> "At home, breaching any of the environmental rules will incur curses from the gods while at school, will attract corporal punishment. Community members, as well as family members, served as watchdogs to protect the environment. People were not allowed to harvest firewood from certain forests and trees due to superstitious reasons. Some water bodies were deemed sacred and untouched. Generally, the environment was supposed to

be treated with care and respect." (Josh: 61 -62)

From their recounts, some participants indicated that these traditional environmental laws no longer exist and attributed this to the disappearance of traditional environmental beliefs and practices (TEBP) and the custodians of these customs and practices. They reported that the traditional 'keepers' or custodians of such practices that protected the environment are no more.

> "I remember there was a thick forest in our village, no one could even fetch firewood from that forest. Every year they went in there to perform sacrifices and the forest was intact. I visited the village recently and that forest is almost gone. Even those people who would go there to perform the sacrifices are no more there…" (Josh: 58)

> "…the environment was presented to us as containing spirits in the forest, water, trees and so on and so environment was not so much abused. Now we call that primitive, but they were wiser in preserving the environment." (Ray: 6)

With regards to sanitation, apart from few public toilets, participants recounted not having toilets and stated that practices such as such as clearing lands for farming, charcoal burning as well as open defecation were considered 'normal practices'. Indeed, Vera noted that they were considered as a rich family because they had a toilet within their compound while most families around them and elsewhere practised open defecation (Vera: 6).

> "With regards to sanitation, apart from few public toilets, Entire town where I grew up, didn't have toilets in people homes. As a result, majority of the people were answering natures call in the Bush which was normal. Majority of the people in the community were also farmers. Hence, clearing trees from the Virgin lands for farming was normal. This was exacerbated by some charcoal burners in some rural communities around the town." (Bob: 53)

King recounts that as a child, they had to adhere to laws made by government on sanitation otherwise they risked being arrested by the town council task force who were called 'Samasama'(King:47), Bob remembers that government agencies such as the Forestry Department concentrated on planting trees and selling seedlings of some species of trees (Bob: 53). Recently, however, Ray notes that state propagated environmental laws are not enforced anymore.

> "Today everything is changed we no longer respect those laws and the ones government has put in place is not enforced.…" (Ray: 6b)

The recount of Ray is in two folds, first that traditional laws are no longer respected and secondly that laws put in place by government are not enforced. But Milli notes that one main reason for failure of government to enforce environmental laws is a matter of politics.

> "Mmm! Arrh! …, these are the issues that keep worrying me, we witnessed what happened at circle flooding (*an incident which happened in June 2015, where over a hundred people lost their lives due to flooding and its attendant effects*) and you ask yourself what happened? What was it? Gutters are being choked, people are throwing rubbish everywhere, defecating around and all those stuffs, eventually, these things will happen and thinking that after this has happened, the people will change their mind and say no! We did this that's why this happened, so can we change it, even if our layouts [*housing and road layouts*] are not better, can we do it? But for political reasons and all that, they leave them, and even when is time some places like Sodom and Gomorrah in Accra close to the Agogloshie market, *(a temporary housing for mostly traders believed to be sitting on waterway and which governments over the years have never had the political will to deal comprehensively with)* you are thinking that this is a place where there is also fire outbreak all the time, why can't they take them out? But they leave them, what is the reason? You go there and is a vote for me! Vote for me! If you take them away who is going to vote for you? So, in the end, they neglect it." (Milli: 15-17)

At school, EE was acquired through lessons, other school activities such as gardening, tree planting and playing with friends. According to some participants, although formal education on EE seemed progressive, early education at the basic school level was not much and did little to dispel notions held on TEBP (Traditional Environmental Beliefs and Practices) and pre-tertiary education did not cover much of EE. Much of formal and informal education on EE according to some participants was not received until tertiary level and for persons like Josh, once that education was received, a personal concern and passion for the environment was planted.

> "At school, I learned about environment in lesson taught on the environment. I related to the environment in that we planted trees and took part in communal labour and cleaning the school compound. Also, at play time at home and school with friends we hunted for little animals, picked fruits and so on so you could understand nature gave back something. (Bob: 53)'

> "I learnt about the environment through friends, home and the community and at all levels

of my education progressively in the right and positive way." (King: 47)

"The early school didn't do much to expel these beliefs, later education was related to courses I did only." (Frank: 56)

"At school, there wasn't much EE, but we cleaned and had lessons on hygiene and sanitation…" (Ray: 6)

"At school, much of environmental education in the basic and secondary levels were on planting of trees cleaning around the school compound. Emphasis was on environmental cleanliness with little being done in the areas of environmental pollution and degradation. At the tertiary level, more emphasis was placed on environmental pollution and degradation. Priority was given to sustainability of resources and protection of wildlife. Environmental education and employment opportunities were also highlighted. Importance of the environment to man's survived was well emphasized. Whiles growing up, I related positively with the environment by maintaining good environmental hygiene and avoiding destruction of vegetation and pollution especially of water bodies but didn't get enough education both formally and informally on environmental issues and degradation until I reached the tertiary level. But now, I am so passionate about the environment in my daily activities due to environmental education I received at the tertiary level." (Josh: 63 - 67)

From the foregoing, there were three overlapping and interacting institutions where respondents were environmentally educated; at home and the community including the school and so EE was acquired through formal and informal means through agents in such institutions. At home, EE was down to personal hygiene and general environmental cleanliness around the house as well as farming activities. Although participants talked of lessons they took in school involving EE, they couldn't remember beyond the practical experiences they had in connection with the environment and EE like planting trees, gardening, cleaning the school compound and hunting with friends as well as punishments that came with breaking traditional environmental laws. Outside school, EE was embodied in traditional beliefs and practices concerning the environment which was presented in the form of myths, stories and traditional laws to be obeyed or sanctions in breach of those laws and so adherence to traditional environmental laws and taboos embodied in TEBP was key in EE at community level. What was deemed as safe or good environmental practices and behaviour varied. For example, while it was forbidden to

enter a sacred forest, fish or farm on certain days, it was normal to cut down trees for farming, burn charcoal and openly defecate. Although some participants said that much EE was at the tertiary level, a check on their demographics showed this was due to environmentally related courses they read at this level and so, had they read other courses, their experience might have been different.

7:1:1:2 Professional Training and Competence

From the demographic data (See Section 6:4), participants self-rated their teaching expertise in teaching EE as ranging between Good to Expert. On their professional training, participants spoke of its relevance to teaching EE at CoE.

7:1:1:2 (a) Relevance

Most Participants indicated that the courses they read were relevant or somehow related to what they currently teach (Jane: 22-24, 32; Josh: 31; Ray: 32-34; Frank: 29; Aha: 26-27; King: 27; Vera: 24). But while agreeing on the relevance of courses to what they currently teach, Jane, King, Connie, Aha and Frank, for instance, said more training was needed.

> "What I studied has a relevance to what am teaching, the only thing is that errrh! My observation since I came to the college of education, I think that we lack more of the practical aspect." (Jane: 22)

> "I cannot say am an expert, so I would welcome any in-service or training course that would expose me to further knowledge in this area." (King: 27)

> "Well I think I have been trained to teach science and inherent in it some aspects of EE. There are times that students have brought issues to be discussed and asked questions that would have been difficult to deal with without this kind of training. But I think I will need more training because there may be some special topics that will need special training." (Aha: 26-28)

> "There is a relation of courses I did and what am teaching. All courses I have done is related to social and environmental studies up to the master's level…" (Frank: 29)

Some participants however stated that, they lacked adequate preparation or were ill-prepared to teach EE. This according to them stemmed from course disparities between what they were

taught at the university and what they are expected to teach at the CoE. The content of courses participants read did not adequately address the scope of EE they currently teach.

> "I read B.Ed. social studies…and in my time, we were having subject specialization...and I specialised in economics, so to be honest, I can say that am not well equipped …even at the master's level and for such a course I realised that what we were doing did not toe the line of what we are teaching here in EE, …some are saying integration, some are saying amalgamation, some are saying human relation and the rest, and this poses confusion. Am trained in X university, someone is trained in Y university comes in and is very good in handling geography aspect…, am from X university and we never did geography, I went to the economics department and so am not able to handle the geography aspect well and this is affecting the students all over." (Milli: 46 and 49)

> "I think what I read is relevant to what I teach in a way, but I should have been more prepared. Because even at the university level I never saw, for example, some of the ecological equipment and am now expected to teach students." (Connie: 26)

Some participants indicated that, they taught EE simply because they were trained to teach Science or Social Science which happened to address some EE topics at the college level and thus, they were not trained with the intent to teach EE. Aha therefore suggests that special training be given so they can teach topics not encountered during their professional training otherwise, teachers who are deemed qualified to teach main courses into which EE is integrated will still feel ill-equipped.

> "Well, I think I have been trained to teach science and inherent in it some aspects of EE... But I think I will need more training because there may be some special topics that will need special training. Once there are new courses or new elements introduced in there we will need some training to deal with how best to teach those." (Aha: 26-28)

> "…so, I can say that well I have been taught but am not well equipped in teaching EE. Sometimes I must call a resource person to come in to help." (Milli: 48)

Interestingly, others felt they were underutilised professionally. Josh and Vera visibly frustrated, lamented that although they had much knowledge and training on environmental issues, they were limited by the curriculum on what they could teach and thus advocated for an expansion of the EE curriculum to enable them to impart much of what they have learned.

> "… even though you are not able to give out what you would have wished to give out, as I was saying I wish EE would have been expended to cover a lot of what I have studied

but am not given the opportunity to impact because am teaching a subject which has little to do with EE and as a professional once is given to me, I have to handle it. When you have been trained to teach something or studying something you will wish that you are giving the opportunity to teach other people, but if the opportunity is not given with time you see that the knowledge becomes irrelevant. So much of what I have learned on EE is not passed on because the syllabus doesn't give room for me to teach it." (Josh: 31)

"I don't get the chance to teach the chunk of what I studied in EE because of the restriction in the curriculum. So, I think the course should be set out in such a way that teachers like us will have the opportunity to impart what we have learnt in EE for the benefit of the nation and indeed the world." (Bob: 25)

7:1:1:2 (b) Continuous Professional Development (CPD)

All participants identified CPD as an integral part of teacher development and a very necessary step in achieving educational goals. The success of teaching in general and specifically EE which is very dynamic in terms of its content, delivery methods, as well as application of knowledge hinges on CPD. All participants underscored this importance and were generally concerned and angry in some instances that for years (up to 11years in some cases), they had not been through any CPD programmes. They indicated that teacher effectiveness is heavily reliant on CPD especially with EE where there are constantly new and emerging issues. Ray stated that although opportunities such as conferences exist to update teachers' knowledge and practices they never get to hear of such conferences, although he did not state whose responsibility it was to let them "hear of such conferences". Others like King indicated that administrative inefficiencies, such as not delivering such invitation letters on time to teachers denied them the opportunity of attending and benefiting from CPD programmes.

"In-service training for teachers is very key. Teachers should be supported to be competent to teach courses they handle." (Frank: 34)

"...I think teacher effectiveness, does not even depend on the number of course you did but continuously upgrading and updating yourself, and not just formally so you acquire certificates but to broaden your horizon every now and then. Especially with an area like EE where there are emerging issues every now and then. There are conferences held internationally and we don't even get to hear of them so much." (Ray: 32)

"…Again, the few times that letters have arrived for workshops, they are kept until the

time for such workshops are expired and sometimes it pains a lot." (King: 31)

Participants generally thought it was the responsibility of the college or the university overseeing its programmes to organise CPD. Though some participants indicated they had attended such workshops during their professional training at the master's level and about a year ago and have knowledge of other teachers doing same, others indicated the opposite.

> "…So much of my exposure to these workshops in addition to the content knowledge is when I was doing my second degree." (Josh: 33)

> "I think I have been to two or so in the past year. I know some teachers have also been going for such." (Aha: 31)

> "No! No! Never! Since I started teaching in college (12 years) there has never been such a workshop organised." (Milli: 51)

> "Those things (CPD) are like a no-go area. They exist on paper, but they don't exist. For the past six years, I have not attended any workshop to build my capacity. These in - service courses are very important but for whatever reason they are not organised. They help build the capacity of the teacher to be exposed to new methods of teaching, so they can function effectively." (Bob: 34)

Some participants reported that they have in time past, approached the school authorities and were willing to make time to attend such programmes if they were organised, but were told there were no resources to organise such programs. Confronted with this situation, some participants used their own resources for such training purposes.

> "I can't remember having any in 11 years of teaching in CoE, even though I think it should be done because it helps us to share ideas and it improves your teaching skills and teaching methods. But whenever we raise the topic they talk about lack of resources, but if it is time, we can make time." (Frank: 31 -33)

> "These in-service courses are very important but for whatever reason, they are not organised… But I have had to do this in my personal capacity." (Bob: 34)

> "…Sometimes I go for some on my own for my own personal professional development." (Aha: 31)

Participants did indicate that there was a current CPD program Transforming Teacher Education and Learning (T-TEL) which is a UK aid sponsored programme for teachers in CoE

in Ghana, but were quick to add that this program only addressed the pedagogy deficiency of the college teacher, giving an indication there were other needs that needed redress, but which were not covered by T-TEL.

> "We should also have occasional in-service training for teachers in the colleges of education. Currently, we have the T-TEL…but that is not enough. Even if in-service training is organised even once a semester involving all teachers to build capacity and will help us train quality teachers who will help transform lives of pupils and others in the community." (Bob: 28)

> "Well, since I came here, I don't remember going for any in-service training. T-TEL (Transforming Teacher Education and Learning) is about the only thing we have had going on now but that is only on methods of teaching." (Connie: 29)

In summary, although participants generally self-rated themselves above Good in terms of their competence to teach EE, further probe during interviews indicated that there were issues when it came to their ability to teach EE. Course disparities at universities and CoE meant that some teachers were ill-prepared and that there was no intentional input in their courses at the university level to address EE at the college level. It also raises the question of how courses are coordinated in universities that train teachers for CoE and between universities and planners of CoE curriculum. If these institutions are acting in isolation, such issues will persist. If courses are changed at colleges and or curriculums amended without due process of the universities involved to recognise and amend their courses accordingly, products (college teachers) will not be adequately prepared to teach. Worse still, if these deficiencies are not identified and corrected by CPD which teachers identified as often lacking, then teachers are crippled and left incapable of doing effective teaching.

7:1:2 Main Theme Two: Classroom Experiences

This main theme addressed issues of pedagogies, assessment and previous experiences which related to participants' classroom experiences. Touching on this subject, participants talked of pedagogies they used in class and gave reasons why such pedagogies were used. They

also stated concerns they had on issues bordering pedagogies used in class. On assessment, participants indicated what was assessed and how it was assessed, as well as their concerns on assessment. Participants also talked about their past experiences and knowledge acquired prior to teaching EE and how these influenced their teaching of EE and way forward.

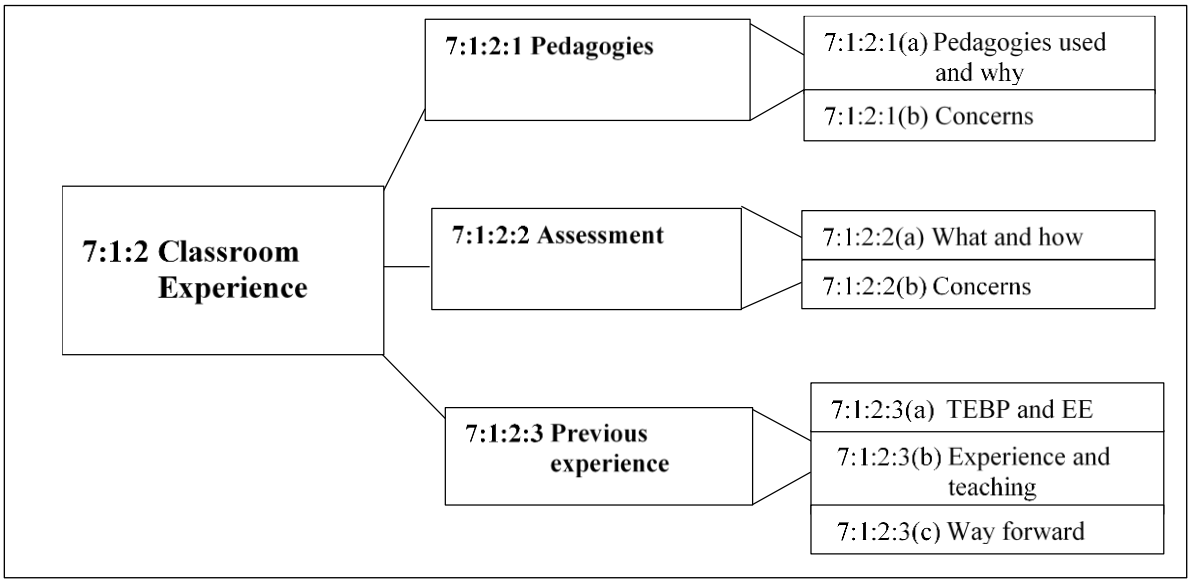

Figure 7.2: Themes and subthemes on classroom experience

7:1:2:1 Pedagogies

Connie, Josh and King stated that a topic determines how it is taught or the strategy that should be used in teaching, so various pedagogies may be employed in teaching various topics. Others also stated that, their philosophy of teaching affected how they taught and assessed students

> "Each topic lends itself to a teaching method, so we use various methods…" (Connie: 42)

> "So, it all boils down to how a person is giving education on the environment" (Josh: 12)

> "It usually will depend on the topic to be taught, but as much as I can use the child centred approach…" (King: 40)

> "I was aligned with the constructivist approach to learning and that influenced my philosophy of education and hence my way of teaching." (Bob: 31)

7:1:2:1(a) Pedagogies used and why?

Participants talked about pedagogies they employed or did not employ in teaching EE and gave reasons why that was the case. Most of the teachers used or advocated for interactive pedagogy or student-centred approach to teaching EE. Among the strategies participants stated they used in teaching were field trips, discussions, simulations, project method, debates, role play, dramatization, brainstorming, demonstration and lecture method (Jane:36; Josh:47; Ray:50; Frank:50; Milli:65; Connie:42; King:40; Vera: 37). The reason for using such 'active' pedagogies they stated, was to place the child at the centre of the teaching and learning process to affect their attitudes. Others like Bob stated that, what informed their choice of pedagogy was that trainees must learn by example and so pedagogies used by the teacher should inform trainees as to what pedagogies they should use upon completion. For these participants including Jane, Ray, Milli, Connie, Josh, Connie and Vera, participatory or child-centred approach to teaching maintains interest, helps develop skills, critical thinking and problem solving and improves students class attendance as exemplified in the following quotes;

> "We have been using role play because a lot of things we teach is about attitudes. We use simulation, discussion and even on a few occasions we use debate. These are active teaching-learning ways of teaching where the student is placed at the centre of learning. These are the methods I use to teach and advocate that they use." (Ray: 50)

> "We are all advocating for student-centred learning. But if we use the lecture method all the time in school and then tell the trainees to use the child-centred approach to completion to teach, how does that work? They should learn by example; we should lead by example. If we train the students by the methods we use to teach them, for example, give them a cases study that they need to research on or a project to execute, they will learn how to use these methods to teach and apply them in their own teaching upon completion. It will also make teaching-learning very interesting and call for student participation in the teaching and learning process." (Bob: 44)

> "I use discussion method because it allows for the student to share ideas and different experiences for learning purposes. I suggest Project method be used, it is also very good, so they can execute a project. They can visit an ecologically rich place and bring out their observations as a project and it would be discussed, I think that can help a lot to improve EE." (Josh: 47)

There were also others like Frank and King who stated that lecture method helped complete the course outline on time. Frank stated that in addition to finishing the course outline on time, lecture method was a preferred choice because trainees were not at the basic level. Yet this participant stated that the child-centred approach was good for trainees and advocates that trainees use this approach to teach at the basic level when they complete, as to where trainees were supposed to get this training on the use of child-centred approach in teaching from, this participant did not indicate.

> "It usually will depend on the topic to be taught, but as much as I can I use the child-centred approach, but truth be told, majority of the teaching about 80% is lecture method." (King: 40)

> "This is not basic level, so we use the lecture method or teacher centred method as well. The lecture methods help you finish the course outline quickly but is not the best teaching method at the basic level. But I believe the child centred method is good for our students here so that when they go out, they would put the child at the centre of learning, and I believe that helps better. The child-centred approach, this is what we advocate for them to use when they go out." (Frank: 50-51)

7:1:2:1(b) Concerns

Some participants were concerned that since students did not take EE seriously and everything was down to examination, the game changer was the kind of pedagogies used in teaching and advocated for participatory pedagogies to be used if time can be made for it. They also indicated that students needed exposure to the first-hand experience and other engaging pedagogies in EE. Another concern was that students concentrated on getting information for exam purposes and that students were not serious with EE topics calling them "backups" to other subjects. They indicated that students missed lessons due to lecture methods used constantly by teachers.

> "Sometimes the students themselves will tell you we are only using this to back up our maths, English and science so we will never fail, Environmental Science aspect, you can easily get an "A" and go and so the mentality is on the concepts, the ideas, the principles and go away. But if we are to really help them, then we need to do more field work, we need to come out of our shell using more of the child-centred approach if there is time…"

(Milli: 44)

> "Aha! … We don't have more of field trips, and we don't have more of …you know! Errrh! First-hand experience thing, so you see that students just grab the information for examination purposes. They don't really impact the right thing to the kids." (Jane: 8)

> "Most students are reluctant to come to class because it the same lecture method used to teach all the time. But if they are put in groups given case studies to solve or projects to execute, it would arouse their interest. It will also help the student to develop research skills, such as investigation, observation, discovery, analysis, critical thinking, synthesis, etc. when they go out to collect data, analyse and present in the classroom, these skills and leadership skills will be developed, and it will help them to became good teachers and help them in finding solutions even to personal and societal problem." (Bob: 45)

Jane and Josh stated that pedagogies used for teaching main courses into which EE is integrated is used in teaching EE, although they were of the view that methods for teaching EE should be different from science or social studies and should be made more practical. In the experience of Josh, such practical lessons were appreciated during his own professional training. Jane stated that she made efforts to explain to students' methods or pedagogies that could best be used in teaching EE.

> "Right now, is only methods used in teaching science topics that are being learnt by the students because EE is incorporated in science but looking at the critical position that EE occupies it needs to be given its own attention and appropriate methods of handling it. I think personally there should be a slight distinction between methods used to teach science and those used to teach EE, So, environmental issues should not be taught with the lecture method or theoretically, you can make it practical and let them observe the environment, they can go on excursion to different paces and write reports on such issues concerning the environment and so on. Like in my own case when I was studying for my masters, I appreciated EE much when we went on excursions, field trips and the like. So, EE should be made a practical course for people to have interactions with issues relating to the environment. It should be made lively and real for students, rather than cantering everything on classroom tuition which is a theory." (Josh: 27, 48 – 50)

> "There are a few methods that cannot be used in actual science teaching, so we try to distinguish and make it clear that these are the ones that can really help in teaching environmental studies and these are the ones that can really help, because when we talk about biology and science there is more to it. Some use purely activity, some use group, some use other means but with environmental we rely more solely on the field trips which is not really in the other aspects of science." (Jane: 36)

Some participants indicated that the curriculum made provision for pedagogical knowledge

to be acquired by trainees in their second year of training, what was lacking was commitment from both teachers and students.

> "With the second year, they do methods and it sometimes involves role play, simulation, dramatization and so on and it is usually for their on-campus teaching," (Milli:62-63)

> "If you look at the current curriculum, all the methods they need to teach are in there but is a matter of commitment, so I think we the teachers need to be committed and the students too must be committed." (Frank: 27)

7:1.2:2 Assessment

Participants talked on what was assessed in terms of content and consideration of three domains of education (cognitive, psychomotor and affective). They also indicated how these assessments were done and what informed such choices.

7:2.2:2 (a) What and how?

Aside Bob who indicated the use of seminars and presentations as means of assessment in some instances (Bob: 48), all other participants indicated that students were assessed in the same format as the external exam, thus written tests were used. They also indicated that as with the final exam students were mainly assessed in the cognitive domain which involved recall of concepts and facts. To them, once the external exams did not incorporate such aspects as the application of knowledge or practical, they did not assess students on those lines either (Vera: 35; Jane: 38; Josh: 53; Ray: 22, 55; Frank: 54; Milli: 67; Aha: 9-10; Connie: 14; King: 40). In fact, some like Josh as indicated in the quote below maintained it was a waste of time to teach and or assess students when they won't be externally examined in such areas.

> "…It is content based (talking of external assessment) and even not much into the application aspect of it. If there is a question on pollution, maybe it would just be on the types of pollution we have, effects of pollution and all that, but how the student is expected to demonstrate the application aspect of it, the questions don't go further to address that. They have not examined in the practical aspect anyway in the examination, so I usually don't waste time on it." (Josh: 53)

> "They are assessed based on recall of facts and, so we teach them as such. Application of knowledge does not really come in and, so you teach based on how they are assessed.

Even with internal exams, the questions set demand recall of facts." (King: 40)

"…you see, the external exam is based on what is in the curriculum, so the students are prepared in that light. The internal assessment is structured like the external exams which are based on theories, fact recall and knowledge." (Vera: 35)

"Due to limited time, the fact that practice is not assessed and the nature of their exams, I set only theoretical questions just like they do in their final exams." (Milli: 67)

7:1.2:2 (b) Concerns

Some participants admitted it was all too easy to assess students on cognitive ability and sometimes on skills they have acquired (psychomotor domain) but assessing students on attitudes and behaviour which is part of the affective domain is difficult. However, they were of the view that if practical work or activity-based learning was introduced, it will help in developing positive environmental attitudes even if it is not examined.

"I believe the issue of assessment is very key here. It is very easy to assess cognitively, it is also very easy sometimes to assess skills of a person, the one that is difficult to assess is that aspect that must do with attitudes, habits and so on. So, if there is a component which requires that the student must do some practical work which is related to attitude or which can generate such attitude in them and which is not examined by the end of semester exams, that would be helpful." (Ray: 8-9)

Some participants recalled that, EE lessons and examination in the past contained practical components which sometimes included educational visits and hand-on activities. Milli recalled educational visits she went on with students and indicated that students performed well in the examination because they did not have to do rote learning or struggle to remember facts, she lamented that presently all that is taught is the cognitive aspect at the expense of attitudinal and behavioural aspects of EE.

"I remember we went to Aburi botanical gardens in relation with a topic in E. Science and when we came back, they were able to produce what they had learnt from there, this was way back in 2005 and the questions that were asked then in the exams, they did well in it. The questions were then practically related, I remember it concerned a field trip but can't remember the exact question, but it was practical. Then there was no need for rote learning. Those who went for the trip knew how we did the whole thing and upon return, I even asked them to write a letter of appreciation to the managers of the place. So, when they were asked in the exam …, they knew exactly what to write. Today all that we are

> teaching is theory. The attitudinal and behavioural aspects of EE have been taken out totally." (Milli: 34-35)

Although participants stressed the need for assessment to be comprehensive and not just limited to 'pen and paper' and indicated that some aspects of EE required practical lessons, they stated that a teacher dwells on teaching such practical aspects at their own disadvantage and that of the students since such aspects will not be examined externally. As such, concentration was on what would most likely be examined to ensure students pass their exams.

> "Also, in assessment, there is the need for a paradigm shift from the traditional pen and paper kind of assessment to comprehensive assessment." (Bob: 10)

> "… There are some areas that may require practical lessons but if you are to dwell on that, you would be using the time to teach stuff that would not be examined in the external examination. So even in assessing students, I stick to testing them on theory just as in done in the final examination. Short answer questions and objective type questions which mostly demand a recall of facts. So, most of us shy away from the practical aspect and concentrate on what we think will be examined for the students to pass." (Aha: 8-9)

> "Currently assessment is only on the cognitive aspect. Once students can recall facts, they can pass their exams and the other aspects of building attitudes and behaviour modification are left out. Practical wise, students are nor engaged so they are not examined in that aspect." (Connie: 14)

7:1:2:3 Previous Experiences

Participants recounted their experiences especially with traditional environmental beliefs and practices (TEBP) and how these experiences influenced their teaching and suggested the way forward.

7:1:2:3(a) Traditional Environmental Beliefs and Practices and Environmental Education

Participants reencountered their experiences with TEBP and how these influenced their teaching. Participants indicated they were familiar with TEBP and or had encountered it in one way or the other. However, while some (Jane: 40; Josh: 55-56; Ray: 55-56; Frank: 56; Milli: 69-71; King: 42-45), indicated they still believed in, referred to and used aspects of TEBP in teaching, others (Bob: 50; Vera: 39) indicated it was only referred to when it was mentioned in

a topic. Bob indicated that some students still believe in TEBP. However, Bob's statement that his class usually ends up looking at reasons why such practices were put in place and coming to 'academic conclusions', reflects the participant's admission of moving beyond believing in TEBP.

> "Yes! Yes! On several occasions, I have had the chance to input TEBP in my teaching. I would tell you a short story, I was living in Saboba from 2000-2003 that was my first posting. One day I was travelling to tamale with a white man who was a Catholic priest. Between Saboba and Yendi we got to a village called Kpaliba and there was a forest just by the road. The priest told me that there was a shrine and that's why even though all around the forest trees had been cut no one dared to cut any in that forest. He explained that when he first arrived with some missionaries, the whole village was full of the vegetation of that kind, but human activities had destroyed all of it leaving only that stretch of the forest because it is believed the gods would punish anyone who dares desecrate the place but cutting wood from there. So, when am teaching about afforestation and the need to protect the vegetation, I use that example, as cultural practices that helped to preserve the environment for sustainable use. In certain villages, they have water bodies they do not allow fishing activities in there, you go there, and you find that many species are preserved and the ecological life there is intact. The student will sometimes give many examples because many of them have such places in their localities." (Josh: 55-56)

> "…and I asked them if they could identify things in the community that can be used for teaching and they were able to mention geographical areas of interest, some gave me cultural places of interest like the shrine, chief's palace, they gave me a lot …They even mentioned the Paga crocodile pond and told me it has cultural implications and the crocodiles are seen as gods, some mentioned the monkey sanctuary and told me the monkeys represent something in the community, so we do make reference to it. Sometimes we refer to historical places of interest and talk about museums, cultural interests and places." (Milli: 69)

> "I hardly make use of or refer to them (TEBP) because is not mentioned at all in the environmental science curriculum. But in teaching a topic on tourism in Ghana it is stated clearly there and, so I refer to them when teaching that topic. In that topic, we teach on things like sacred forests in Ghana and their benefits and so on. It usually sparks debate in the class. Some student believe is a myth, others believe something will truly happen when you go against what is said. They debate a while and we end up looking at the reason why those things were put in place. So, I usually end up drawing academic conclusions on such debates." (Bob: 50a)

> "I was made to appreciate the environment as a child growing up and I understood the benefits we get from the environment. We had a lot of produce from the environment. And heard a lot of stories about sacred forests, days of rest and so on, we were engaged with the environment in all areas, at home, school and community. I wouldn't be able to tell you everything, but we did a whole lot. We respected the traditional environmental laws because breaking them had grave consequences some including death and

> diseases…I believe in such education though they might not be as effective so as and when I can I invite persons from the community to talk to them on importance of such things and we discuss what can be done in our current situation to protect the environment." (Frank: 56)

Ray did mention that there was some wisdom in the fear, myths and superstition which helped preserve the environment (Ray: 54 -55) and King stated although not formally educated, the indigenous Ghanaian took better care of the environment and related to it in a more positive way than is currently done (King: 42-45), a point agreed on by Ray who stated that, the current state of Ghana's environment, presents the indigenous Ghanaian as "wise" and the current generation as "foolish" and suggested the current generation will be wise to learn from the indigenous Ghanaian (Ray: 56). Milli specified that while this aspect of indigenous knowledge was referred to and used in lessons, visits to some of such places of cultural relevance was dependent on the school, as resources were lacking, and teaching was limited to the classroom (Milli: 69-71). This view was supported by Frank who said that in as much as the community was engaged during such lessons in his class, there were financial implications which worked against its sustainability (Frank: 56). Among participants, there appeared to be a split between the use of and reference to TEBP during teaching. Although all of them experienced TEBP growing up, some continue to believe in and refer to them during their teaching while others tried to unmask the mysteries surrounding them during teaching. Something must have therefore happened or not happened to change or reinforce these long-held beliefs of participants. May be, a kind of education, exposure or experience be that formal or informal, intended or unintended which either disrupted these long-held values, beliefs and practices or reinforced them.

7:1:2:3(b) Experience and Teaching

Generally, all respondents indicated that some experiences influenced their teaching. For example, some participants' appreciation of environmental issues and awareness of the

environment influenced their career choice and teaching practice. Some participants explained how early experiences affected their appreciation or otherwise of environmental related issues (see section 7:1:1:1) and related this to how it informed inputs they make during EE lessons, perceptions of EE and what they think students ought to be taught in EE.

> "My awareness of the environment has greatly influenced my teaching of environmental science. This is because my decision to study geography a core component of my environmental science programme was probably influenced by my appreciation of the issues relating the environment." (King: 49)

> "… during my training I was aligned with the constructivist approach to learning and that influenced my philosophy of education and hence my way of teaching. Secondly, in my assessment of students…my professor at the university who was an expert in assessment taught me that and that it is possible to have all student perform well in assessment. And so, that encourages me to vary my methods to meet the needs of students, so they all perform at their optimum abilities… I teach environmental and social studies at the College of Education level where the issues in the community are not all that different from above. With education and hindsight to these experiences, I am able to relate these to the students when I can and educate them on what they need to do." (Bob: 31-32, 55)

> "When growing I realized that harmful effect of human activity on the biophysical environment can have an effect on the lives of organisms. This prompted me to educate my students on how overpopulation is causing all type of environmental issues (water pollution, urban sprawling, deforestation, overpopulation) and to educate them on how best these issues can be solved." (Jane: 45)

> "So, environmental issues should not be taught with the lecture method or theoretically, … they can go on excursion to different places and write reports on such issues concerning the environment and so on. Like in my own case when I was studying for my masters, I appreciated EE much when we went on excursions, field trips and the like… These experiences have contributed a lot to my teaching of environmental education/science since most of my examples, illustrations and emphasis are usually based on personal experiences and encounters with the environment." (Josh: 49-50,70)

Some participants were of the view that very little is being done in terms of EE in the school especially when it concerned TEBP and not much was done outside school either. Frank for example against this backdrop invited people from the community to help.

> "Early school didn't do much to expel these believes, later education was related to courses I did only." (Frank: 56)

> "Whilst growing up, I related positively with the environment by maintaining good environmental hygiene and avoiding destruction of vegetation and pollution especially of

water bodies. But didn't get enough education both formally and informally on environmental issues and degradation until I reached the tertiary level." (Josh: 67)

"At school there wasn't much EE, but we cleaned and had lessons on hygiene and sanitation and did some gardening and farming at home." (Ray: 6)

Jane and Josh did indicate that there was very little media information on EE growing up. Presently, however, Josh recalls that sparingly, there are such issues on television and indicated his interest in watching such programmes.

"I had very little if any media information on the environment while growing up. I, therefore, can't recall any. But in recent times, I have once in a while seen some short environmental issues on TV, I actually enjoyed the session". (Josh: 68)

7:1:2:3(c) Way Forward

This theme was in relation to what participants thought was the way forward with regards to traditional environmental beliefs and practices (TEBP) in EE. Ray stated that it would be wise to learn from TEBP not from an angle of fear, but from an angle of environmental sustainability (Ray: 57). The belief that we could still learn from TEBP and that it was beneficial in environmental protection was shared by some participants (Jane: 40; Frank: 56; Milli: 69, 71; king: 42-45), whilst others (Bob: 50; Josh: 58) indicated that the way forward with regards to EE did not lie in or with TEBP. Participants pointed out that TEBP is not accepted in the global knowledge space because there is no scientific basis to its claims. (In section 9:3:1:4, I have explained the scientific basis and concepts in some of these taboos and practices). Here are what some participants said:

"We will be wise to learn from TEBP in a different way, not that of fear but of sustainable behaviour." (Ray: 57)

"So, I refer to the fact that our forefathers were not formally educated but they believed in the positive relationship between man and the environment to preserve endangered species of trees. They preserved sacred groves and all that, but religion especially Christianity is ebbing these believes, and people are now abusing the environment… so traditional environmental practices are not revered anymore." (King: 42 - 45)

"I visited the village recently and that forest is almost gone. Even those people who would

> go there to perform the sacrifices are no more there, most of the inhabitants are now Christians. So, for me, the only way left is now education, if the people know that if we do this these are the consequences and they really understand it and put it into practice, the environment can be preserved." (Josh: 58)

> "Maybe our forefathers did not use the name green belt, but they knew, for example, preserving the vegetation brought several benefits. Western education kind of prepares man to be inquisitive to the extent that some grow up and think that everything about Africa is bad. Some will not accept them because there is no scientific basis for these claims. These are the negative effects of Western education with regards to observing our traditional laws." (Bob: 50b)

Some participants (Bob: 50; Josh: 57-58; King: 42-45) also indicated in earlier quotes above that religion and formal education has ebbed away TEBP and were of the view that EE is more likely to succeed using formal education. Josh for example indicated that foreign religious beliefs left people unafraid of the consequences of breaking traditional environmental laws, ignoring such practices and obliterated the 'fear' aspect of TEBP which ensured environmental protection.

> "…Two things have accounted for this, Christianity and western education. Christianity is fast growing and does not support this kind of reasoning. Some people even believe that, if they say nobody would fetch water from this water body, once I am a Christian I can fetch, and nothing will happen to me, so from the cultural point of view most of these beliefs are being defeated by modern religion. But it is education I would support because education tells us about the consequences of our actions on the environment. If people know that when we keep destroying our trees with time we would be engulfed with desert, that if we emit so much carbon dioxide it would lead to global warming and they know of the consequences of global warming, flooding, climate change and the rest, they may tend to be concerned about it and this education is more likely to make us succeed in protecting the environment. But cultural practices are not the way to go now because of the introduction of western religion and education. In my own village (Gimbali in the Bunkrugu district in northern Ghana) my father was a chief and growing up I remember there was a thick forest in our village, no one could even fetch firewood from that forest. Every year they went in there to perform sacrifices and the forest was intact. I visited the village recently and that forest is almost gone. Even those people who would go there to perform the sacrifices are no more there, most of the inhabitants are now Christians. So, for me, the only way left now is education, if the people know that if we do this, these are the consequences and they really understand it and put it into practice, the environment can be preserved." (Josh: 57-58)

CHAPTER EIGHT

RESULTS II

8:1 Perception of EE Curriculum, Environment and Environmental Education

This chapter is a continuation of the findings and report writing from the previous chapter. In this section, participants' perception of the EE curriculum, the environment and of environmental education is reported. Participants' perception of the curriculum touched on content, needs to be addressed and challenges. The second main theme covered participants' perception of the environment, perception of EE and approach to EE. Just as in chapter seven, a diagrammatic representation of each main theme indicating themes and sub-themes preceded each report.

8:1:1 Main Theme Three: Perception of EE Curriculum

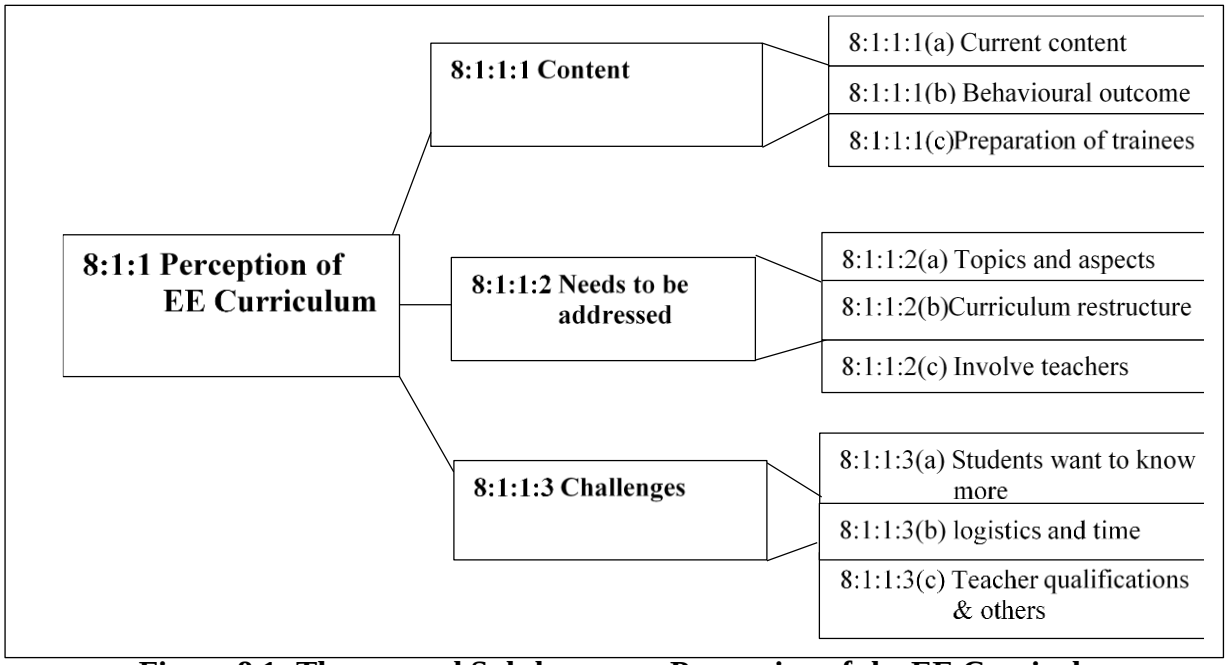

Figure 8.1: Themes and Subthemes on Perception of the EE Curriculum

What teachers think affect their practice (Yero, 2010). Participants' perception of the curriculum was based on content, behavioural outcome observed in trainees and how trainees are prepared to teach EE. It also included what participants identified as Needs which had to be

addressed to improve the outcomes of the EE curriculum. Participants also talked of challenges they faced in teaching EE.

8:1:1:1 Content

This section addressed issues related to the content of the current EE curriculum, some behaviour outcomes teachers observed in relation to the current curriculum and how teachers assessed the preparation of pre-service teachers or trainees to teach EE.

8:1:1:1(a) Current Content

There were diverse views expressed in relation to the current EE content. Some participants (Josh: 13,38; Ray: 16: Milli: 23-24,43; Aha: 9-10; Connie:11,16) said the curriculum was shallow and did not address EE adequately citing reasons as lack of practical lessons which helps students understand theory, behavioural and attitudinal aspects of EE which are not addressed and EE being only 25% of the curriculum for a whole course such as social studies. They stated that enough is not being done to bring about behaviour change in trainees. Others (Bob: 19, 37; Jane: 1 2; Frank: 8, 18, 24; Vera: 12) were however of the view that although there were issues with the curriculum it still addressed EE adequately. Bob, for instance, said despite huge chunks of EE taken out of the social studies curriculum, there were aspects that equipped trainees with skills and environmental consciousness. Although (Aha: 45) opined that topics in EE at college level did not address societal needs, King (16, 18) stated that some changes had been recently made to the curriculum (2015/2016) but indicated readiness for a curriculum restructure.

> "What is presented in the curriculum right now is just scratching the surface. The practical aspect is completely missing and there is no much time given to teach even the little that is in there." (Connie: 11, 16)

> "Behavioural and attitudinal aspects of EE are not addressed in the curriculum. I do not see it at all because if college student should be told repeatedly not to litter the environment in terms of drinking water and throwing the sachets away, throwing empty food packs anyway it means they do not actually appreciate the environment or what it

> means by destroying and polluting the environment… Because I notice many of them do things that they are not aware go against the environment. If there is enough education on environmental issues, it will go a long way to improve our environment." (Josh: 13, 38)

> "Then there had been another gap created, this course used to be Environmental and Social Studies, but to worsen our plight, the Environmental has been removed from the course title so it is now Social Studies and I think Citizenship Education or so and worse still most of the topics on the environment have been watered down…. We should be worried. We should be worried, we should be worried …the Environmental has been taken out and with it a huge chunk of environmental topics…Well, we have bits and pieces of environmental science component in the content areas that can help create environmental consciousness in students. The curriculum though deficient addresses at least some but not all the contemporary environmental issues and that makes me happy." (Bob: 18, 22, 37)

> "The course outline for environmental studies is a new one that we have just started to implement and it's in its second year of implementation. If anything at all let's wait and evaluate it after the third year of its implementation. Some new topics have been added other have been taken out and generally, I will say is 50: 50...But whatever the case it if it is to restructure EE from top to bottom am all for it." (King: 16-18)

Participants agreed that the content of the curriculum and the motivation to teach and learn were examination driven (Bob:19,37; Jane:27; Josh: 43; Ray:40; Milli:23,24,43; Aha:9-10; King:32) and that what was not examined was not taken seriously by both teachers and students (Aha:12). According to participants, the examining body which also happens to be the institution responsible for developing the curriculum for colleges of education in Ghana (Institute of Education-University of Cape Coast) was partly responsible for this situation because the curriculum sought to teach largely only the cognitive aspect and examine same. As a result of this, students did not take any practical sessions or other aspects of learning seriously. Teachers on their part, wanting their students to pass, concentrated on such areas that were likely to be examined. Participants indicated that the cognitive aspects were mostly taken care of and in some rare cases the psychomotor domain was also engaged but that the affective domain was neglected. They indicated that as far as content knowledge to pass examination was concerned, they didn't have a challenge with it, confirming that external examination was based on cognitive domain (see section 7:1:2:2).

"You would expect that when you are teaching environmental studies and social studies the affective should be more, people should dwell more on the affective, but it has been neglected and people are on the cognitive and UCC (University of Cape Coast which is the examining body) would bring the paper and you see is full of cognitive ideas, what would bring the knowledge out. So, is the facts, concepts and principles that they are studying to go and write, so, if you neglect it and you are sending them out to learn in practical terms, they feel like they get to the exam room and what they want they are not getting…" (Milli: 23-25)

"So, you would wish to teach certain things but then if you are going to spend time to do that, other aspects of the curriculum will suffer and since you have a short time frame to finish with the semester's work it may go against the student in terms of their preparation for examination. So, you are compelled to limit yourself to what is in the curriculum." (Josh: 43)

"There are three aspects to all the learning that we try to put in student in each course, there's the knowledge aspects. Example, it is not the case that those who litter the environment don't know that it is not good. Then there is the skill or psychomotor aspect, I believe those who litter have the skill to carry the litter to the bin and so that can't be the issue. The issue is with the affective, the willingness to do what is right, so we must push that a lot and practicalize how that can be done. So, if you are talking about land degradation, then practically, for example, we may have to plant trees, and this must be practicalize, the students should plant trees. And by that, we will be putting in the learners the attitudes and desirable values that will help them deal with environmental problem. I would say that it is the most significant aspect of all the courses… (Ray: 16-18)

"The current syllabus does not give much practical room and is geared towards exams so most of the time is spent trying to help them understand concepts and prepare for examination. I think we should be worried that the teaching is exam based, tailored towards racing to get certificates. So, the hands-on- activities are out and we are doing them and all of us a great disservice." (King: 10, 35)

"…I can say that that one we don't have much problem about that, I mean based on the content they are supposed to know to really apply for the exams, that one we don't have much challenge about that." (Jane: 27)

8:1:1:1(b) Behavioural Outcomes

Some participants said they observed an exhibition of one or two environmentally friendly behaviours which they attributed to the EE students received and as Connie (35) indicated that this kind of behaviour, attitudes and knowledge had been applied by students upon completion to benefit of communities they are posted to. Here are what some participants said;

"In my teaching experience, I have observed behaviour change in the students that I can attribute to EE education they have been given. Some of the students use to walk on lawns

to cut short their journey instead of using the pavements. When I see, then I recall them to use the pavement and with time it has caught up with them and they treat the lawns better and with time, they are gradually extending it to taking care of the hedges and their compound." (King: 38)

"A student of mine grew acacia as part of his own project to form a wind belt and the years that followed other neighbouring schools did same and he called to let me know it was out of lessons learnt in ES. Again, there was an incident in which some students saw they need to mulch trees they planted while other didn't, well the second group lost their trees, they died, but the first group's trees survived, and they teased their friends in class and said they had applied what they learnt in class to ensure the survival of their trees. I have also observed when they weed around, they do not weed to the bare land, they trim the grasses and am sure is from lessons we had on erosion and the need for cover plants on bare lands." (Connie: 35)

"Even last week first-year students were picking sachet rubbers around and I think it was because of a lesson we have had. We were talking about flooding and what causes it and we talked about littering around with empty sachets and all that. They were also complaining about mosquitoes and I took time to explain to them how these things come about and so after the lesson, I saw them picking up empty sachets on campus." (Milli: 60)

Josh observed that second-year students who had lessons in EE, exhibited more environmentally friendly behaviour compared to the first years who were yet to complete that section of the EE course. Jane and Ray indicated that students had formed environmentally friendly clubs in school which carried out activities in the interest of the environment.

"If you observe the first and second years in the school, the 2nd years having gone through some teaching in EE behave more responsibly towards the environment than the 1st years because of the little EE they get here." (Josh: 39)

"One thing I have observed is that they have come to appreciate conservation ahaa! So, to a certain extent, you see them they form even a club… We have a club here purely for energy and conservation and all that they do is that they plan themselves every semester what they can really do even for the environment or the neighbourhood, if they really need to go around and plant a tree or something, they keep doing that." (Jane: 30)

"What we have been doing outside the curriculum is that we have formed an environmental protection club and is for students who wish to be part and they plant trees to beautify the environment." (Ray: 48)

Ray argued that not all teachers will engage in developing attitudinal and behavioural aspects of students training and that some teachers are likely to concentrate on aspects that would be

examined. Frank lamented that although they aim to teach to bring about attitudinal change, educated people still do not exhibit environmentally friendly behaviour and attributed it to a human rather than a curriculum problem, whilst some participants stated that the curriculum was to blame (Bob: 20; Josh:13,38; Ray:20; Connie:11). Milli insisted that topics which ensured behaviour change have been taken out of the social studies curriculum and replaced with geography topics. She also indicated that more failures were being recorded because students were not involved in hands-on activities as they use to be when the environmental science component of the course existed. Although Vera admitted observing some behaviour change, she did not trust the change would be permanent.

> "I think we should be quite worried with this current curriculum. Not all teachers tailor their teaching towards making sure that desirable attitudes and behaviours are formed. Most teachers are concerned with preparing students for exam and won't bother about these issues when teaching, even if the topic afford them the opportunity to." (Ray: 20)

> "We teach to change attitudes but is a problem of human behaviour sometimes when I go to town, I feel very sorry because you see people who are educated throwing rubbish out of cars anyhow, they don't care. I don't want to fault the curriculum; I think is a human problem. The compound as you can see is very clean but when you go outside is a different thing, so I think is a human problem." (Frank: 9-10)

> "We should be worried about the way EE stands now in the curriculum. I feel we are getting off track and if you look at the curriculum. … look around, the whole place is weedy sometimes you would see students would drink water and throw the empty sachets on the ground all because they have taken out the topics that will help the students appreciate the environment away. And now is full of geography, everything geography, geography, what about the environment? How do we see it? So, that is it. When the course had the Environmental Science component added to it, well, for me it wasn't bad because of the real aspect of it, you are able to touch things, have a real feel of it and the students used to understand and I remember those years students perform better in the exams, since they changed it we have recorded more failures because the geography component is too much and weighing on them…" (Milli: 28, 31-33)

> "They are learning a little of environmentally friendly behaviour, it is helping them to change, I don't know if the change will be permanent or not, we are yet to see. Because for now, you see they try not to litter the compound and keep their places of residents clean. But when you go to the primary schools you see some places are littered and they are the same people who go from here to teach there, so we still have a long way to go." (Vera: 30)

8:1:1:1(c) Preparation of Trainees

Almost all participants indicated that trainees seemed to be prepared for examination as earlier indicated in this chapter and not adequately prepared to teach EE. Even participants like Jane and Aha who indicated trainees were well prepared to teach EE, noted that coverage of EE was inadequate, trainees lacked practical and hands on exposure, coverage of EE was inadequate, pedagogy for teaching EE was not addressed and that students could not apply what they learnt in theory to practical situations when confronted with such.

> "They are competent, they are competent! They are competent. The content or curriculum has been made in such a way that it involves all aspects but the only thing that they lack is about having, what do you call it? More interaction or having more field trips to really assist few things for themselves to be able to come out with their own finding. But the content covers everything that can help them teach whatever they are supposed to." (Jane: 19)

> "Yes! Trainees are competent to teach EE because if you look at the course outline for the first year, there is a whole topic on ecosystem, and it involves a lot… It should be a topic that should cover the whole semester, but you must teach it within 2/3 weeks and, so it is compressed, and you must complete it within that time. So, you would normally just gloss over other areas and concentrate on those areas you think would be examined.… The problem of practicalizing the teaching of EE and creating the time for it as well as boosting training of teachers to teach it needs to be addressed seriously. For example, I had taught types of erosion and took students out to see the types, they could explain the types alright in class but when we got to the area, they were stuck with differentiating the types of erosion we saw, so they knew by book what it was but in practical, they did not know what it was. So, if we can have time allocated on the time table for such practical encounter in teaching EE, it would really be helpful, engage the students more and turn out better EE teachers… So, there's an aspect of student's methodology approach which is not addressed. So, if they are taught and tested on strategies used in teaching science or EE it may be helpful as well." (Aha: 19-23, 34)

> "Humm! They are taught only environmental knowledge, but then just as science teachers are trained to teach science, we should have students trained to teach EE. So, they should be taught both content and methods of teaching EE." (Vera: 21)

Josh noted that very little emphasis was given to EE at the college level and this rippled to the basic schools where trainees are expected to teach upon completion. There was again mention of over-concentration of content knowledge and the neglect of learning that developed

the affective and psychomotor domains. Participants indicated that students did not like to be bothered with practical work which will not be examined, and this made participants restructure their teaching.

> ". Because if you look at the modern lives that we are living so many issues go against the environment such that if the colleges of education inculcate much of EE into the curriculum it would spew off to the basic level and the children will grow with environmental consciousness starting from the basis, primary school, JHS and up but because is given little emphasis here when the teachers go to the field you can see they don't even also emphasise EE much and so the children grow up not appreciating the environment much and is replicated in their behaviour." (Josh: 6)

> "I would say no, no in the sense that, this is a training institution. Incidentally, a lot more is geared towards preparing for exams, so when you need to take students through practical steps of building attitudes, by the time you realise is exam time and they must pass several papers within a semester. So even the little practical components, we teach them through theory. So, I would say time is of the essence in this issue. Because there is so much concentration on passing the end of semester exams." (Ray: 30)

> "… the course itself does not have practical components and I wonder how they would handle that at the basic level. As of now students do not get the chance to go on any educational trips, they do not have the opportunity for practical work." (Connie: 22-23)

> "so, if you neglect it and you are sending them out to learn in practical terms, they feel like they get to the exam room and what they want they are not getting, so, sometimes you teach, and you are looking at the questions, sometimes past questions that this is the trend so why don't I go this way? And you do it." (Milli:25)

For King and Jane, the preparation of trainees to teach EE depended on whether they were able to complete a certain percentage of the coursework. They indicated that topics trainees are taught covers what is done at the basic schools and so upon completion, trainees should be equipped to teach at the basic school level. However, both participants also stated that students are usually more concerned about areas that are examined.

> "I think the curriculum has taken cognisance of what they are to teach at the basic level and so if they can go through the full training in the course, they should be able to do that. The students themselves have problems, they are always guided by what would be examined so sometimes, it is when they are on the field that they refer to their notes to teach those other aspects they did not give much attention to during examinations. I feel is about 80% coverage of basic school curriculum on EE/ES. (King: 22 -24)

8:1:1:2 Needs to be Addressed

There were some needs that participants noted needed to be addressed as far as effective teaching of and achieving the goals of EE was concerned. These were mainly in three areas; Topics and aspects of EE that needed to be addressed; Curriculum restructure and Involvement of teachers in curriculum development process.

8:1:1:2 (a) Topics and Aspects

Participants listed areas that needed to be included in EE including global warming and related issues, environmental protection, building environmental consciousness in students, pollution, green house effects, environmental laws, environmental planning, sanitation, chemicals used in farming and fishing and natural disasters. Participants were of the view that environmental issues should be addressed from the local to the global level and should include both established and emerging environmental issues, with more emphasis placed on local environmental issues. This is what some participants said:

> "Well at this level, environment! Environment! issues of the environment, so issues such as planning should be addressed, in Ghana houses are still built on water ways, bushes are burnt anyhow, issues of sanitation are another, other things that would make people appreciate their environment, so they see the need to protect it should be included, they should be conscious of their environment and what it entails." (Milli: 13)

> "Humm! (Chuckles). Well I believe is a progression, it progresses from the local level to the national level and is the same that it progressed to the global level. Look at global warming, this is a local problem which progresses. So, if at the local, national and global level all these problems are confronted it would be good for us." (Frank: 15)

> "Ecology, field trips, Global warming, tsunamis, green house effects, natural disasters and so on and related issues should be factored into the EE curriculum. There is no provision for emerging environmental issues. We should be adding on as more environmental issues emerge and present new challenges." (Connie: 10)

> "Humm! The current environmental issues, both established and emerging including global deeming, global warming and the rest are not being addressed properly and when they find their way into topics in the curriculum, they are very scanty. So, I think something should be done about the curriculum. Given the chance, I would like to see more local environmental issues and how to confront challenges like chemicals used in fishing, farming, and the rest and selling them to unsuspecting public. Most aspects on

the environment that is in the curriculum doesn't talk much on the current environmental issue that we face, and those that are dealt with are scanty." (Vera: 9-10, 16)

Participants also noted that the psychomotor and affective domains were being neglected although these constituted the main domains that can bring about behaviour modification (Josh: 11; Ray: 21, 23-24; Bob: 13; Jane: 8, 14; Milli: 13-15; Aha: 11; King: 8-9). Josh for example, argued that, EE should be presented to trainees in such a way that it induces love for the environment (Josh: 11). The need for a practical oriented EE was again emphasized and Aha advocated for an expanded practical section on condition that it be assessed through examination so that it is taken seriously. Ray noted that theoretical concepts of EE taught at the secondary school were being rehashed at the college level to the neglect of developing environmental attitudes.

"There should also be EE which will induce love for the environment, you see when they love the environment and know what it means and that their lives and survival is tied to the environment, enough measures would be put in place to protect the environment such as not causing unnecessary destruction of the vegetation including our forest and the rest." (Josh: 11)

"I would advocate for a more expanded practical aspect only if it is spelt out clearly in the curriculum and most importantly if the chief examiners will set questions on it, because once it is not examined, students and teachers would not take it seriously." (Aha: 11-12)

"We keep repeating the knowledge aspect which they learnt in SHS, so they have the idea that this is wrong so that makes them perhaps reflective, they also can do the right things so that makes them competent, but to be concerned about the environment which is attitudinal is left out and so there is a big cause to worry, We are not teaching in a manner that would put in learners' desirable values and attitudes that would make them do, not just to learn and pass and forget. We should reduce the number of times we write examination in a training institution. For proper training, students don't have to write too many exams, so that you give enough time for practical experiences." (Ray: 21, 23-24)

The issue of pedagogy was again raised and its importance to teaching EE was mentioned. Frank for example said there was no need for trainees to acquire knowledge if they had no pedagogical skills to deliver and cautioned that students needed to be serious with this aspect of their training.

> "But the students need to be serious with the pedagogy, skills to impact because what is the use if you have knowledge and you cannot impart? If you don't have the skills to impart the knowledge you have, then is useless. So, I believe we should focus more on the pedagogy. The knowledge is fine, they can read but we need to focus on the methods of teaching." (Frank: 25-26)

8:1:1:2 (b) Curriculum Restructure

All participants called for a restructuring of some sort of the EE curriculum (Josh: 51; Bob: 10, 23, 33, 38; King: 18; Vera: 22; Jane: 8, 14; Frank: 6; Milli: 41-42, 49; Aha: 43-44; Connie: 10; Ray: 45). They gave reasons why a restructure was necessary as well as areas a restructure should cover. For example, Bob noted that students do not encounter much EE from primary school and talked of the existence of a disconnection between theory and practice in teacher training and the fact that what is taught at college level does not reflect challenging and current environmental issues in Ghana. Adding to this, Milli noted a disconnection between what was taught in college and what was taught at the basic level and was of the view that EE given to trainees was inadequate, while Aha said the structure of EE was problematic as the same course was given different names at various levels of education. Ray noted that what constitutes EE is sometimes changed at the basic level without corresponding changes to the content of teacher training modules.

> "At the lower primary, the subject taught there is environmental studies, upper primary it is citizenship education at JHS it is social studies and SHS it is social studies so from lower primary there is no environmental studies again, if they are doing it is just a topic in maybe citizenship education. …. like I said before the disconnection between theory and practice, we have numerous environmental challenges and yet the colleges of education where we train them to come out and teach people to be able to deal with those challenges, that link is not there, is broken. The disconnection between what they learn in the college and what is currently happening in the environment in Ghana is a serious challenge am not happy with." (Bob: 23, 38)

> "You see if you look at the syllabus of the primary school, compare to JHS compare to the colleges of education. You see you training these students to go out to the primary school, you are training them to go to the JHS the syllabus itself, you could see that there is difference. That of primary school is different from what we are doing here, that of JHS is different but you see more of what is done in SHS (Senior High School) in these ones. And so, when you pick the course outline is full of geography, today for instance, I must

> teach on reliefs, on formation of rocks and a whole lot and you asking yourself what you are doing?... For me I wish the curriculum planners would have a second look at it and I see the confusion between university of Cape Coast and University of Winneba. The courses they offer seem to suggest that they see social and environmental studies differently. Some are saying integration, some are saying amalgamation, some are saying human relation and the rest, and this poses confusion." (Milli: 42, 49)

> "The nature of the structure itself from basic school is problematic. It is given different names at different stages of the student's education (environmental science, citizenship education, social studies) and this makes it difficult for students to transfer learning. They may learn it in social studies at the SHS level but will not know is the same thing being talked about in science and so on." (Aha: 17)

To ameliorate the situation, participants gave suggestions as to what should inform the curriculum restructuring process which included broadening the scope of the EE curriculum to make it more comprehensive; restructuring EE from basic to college level so children grow with environmental consciousness throughout their education which will hopefully affect their behaviour; EE should be made a practical subject, assessed and scored; EE should be geared towards problem solving; and EE should have special subject teachers just as Science, Maths or English. They argued that in this way, both content and methods of teaching EE can be adequately addressed. Ray mentioned that such restructuring should start from the colleges, so that teachers are trained before the new curriculum for basic school is passed out, this will ensure that by the time the new curriculum is passed out, there will be trained EE teachers on standby to implement the curriculum. Josh mentioned that there was to be a new curriculum for science by end of 2017 and hoped it would broaden the scope of EE.

> "If I were giving the opportunity to give my views, I would say the best way to go is to have EE introduced as a subject from basic level because we are in the era that the environment and environmental issues needs much more attention…, I would love it so much if EE becomes more pronounced in terms of teaching it at the basic level. When children get to the SHS level, they veer into subjects like accounting, arts and the rest so that if at the basic level, they have enough education on the environment no matter what subject they branch into, they will grow knowing that the environment is a key part of their survival. So, it will be replicated in their activities anywhere they find themselves. (Josh: 22, 28)

> "Previously we were having project work, not just action research, so learners are made

> to do something, you observe and score. If that can be brought back so that for example you are scored if you can solve an environmental problem… If much of the theory is taken away to give room for more practical inclined topics, it would help. If the practical aspect is included, it would do a lot of good…Such a restructuring should start from the colleges, so that when those who have been educated are about to pass out you then change the primary curriculum accordingly, since you would already have trained EE teachers on standby who will enforce it." (Ray: 10, 13, 45)

> "I think we should look at it from the basic to the college level so that when the students are equipped upon completion, then they can impart to the basic level and gradually we will be heading towards getting a solution to some of these problems." (Frank: 6)

> "…but then just as science teachers are trained to teach science, we should have students trained to teach EE. So, they should be taught both content and methods of teaching EE." (Vera: 22)

8:1:1:2 (c) Involve Teachers

Participants stated that they were being ignored and not made part of the curriculum development process. Some participants seemed quite upset about the situation and others were visibly angry just recounting this experience. Participants said they were often left at the background and not involved when it came to curriculum development. They felt the curriculum was prepared and brought for them to teach and although they had invaluable knowledge and experience it was not sought. They were of the view that if teachers were made part of the process, the curriculum will be richer, because teachers had different perspectives based on experiences, they have had in teaching which could inform curriculum development. Participants stated that teachers are constantly interacting with basic school curriculum through teaching and supervising trainees on teaching practice. In addition to this, they are well versed with the college curriculum because that is what they teach. These experiences they argued puts teachers in a unique position with wealth of experience which cannot be discounted. Some participants suggested that, if they were not given the chance to help in curriculum development, they should at least be given the opportunity to edit what has been developed so that, they identify themselves with the objectives of the subject before teaching. Following this,

Connie attributed the staggering nature of Ghana's education in general to teachers being left out of curriculum development processes and indicated that when teachers are left out, it becomes difficult for them to appreciate the approaches to use in teaching topics and the outcome expected from students in such courses.

Bob noted that when teachers are finally invited on such rare occasions to be part of the curriculum development process, it is usually not representative enough, a point shared by Frank who further stated that a curriculum designed by others, other than the 'active' teacher doesn't address the needs teachers expect to be addressed. Frank further complained that the developers of the curriculum do not follow up to evaluate the courses they bring for them to teach, a development which worried him. But that was not all, according to Frank, another reason why organisers of curriculum development programs did not involve teachers or involved few teachers, was to reduce cost and make monetary gains. Participants noted that if the development of the curriculum is done 'at that level' (at the level of other curriculum developers excluding the teachers) and not their level (the level which involved teachers) it would have less or no impact. It was participants' position that teachers would be more committed if they are involved in the curriculum process because they would feel part of it and own it. Like many of the participants, Frank was quite incensed by this situation and concluded that "… it is like we are all deceiving ourselves." (Frank: 43). Below are what some participants said:

> "The teachers in colleges are not made part of the curriculum innovation or development process. For six years now, no teacher from my school has been called to partake in the process, we are relegated to the background and the courses are brought for us to teach. If teachers teaching these courses were made part of the process, the curriculum will be richer, because they would bring on board different perspectives based on experiences they have had in teaching or otherwise. Am aware they sometimes call just one person from the whole of northern Ghana to help them do a few things but that is not representative enough. In most instances, it is few lecturers from UCC who sit down design the curriculum and bring for us to teach, and it usually doesn't address the needs we expect it to address." (Bob: 40)

> "Teachers are frontline implementers and frontline supervisors of the curriculum, their experiences are enormous, from lesson preparation to teaching, to interaction with students, assessment, etc. gives them much insight and experience to make good input and give feedback which is developmental in nature in curriculum developmental in nature in curriculum development. We are constantly interacting with the primary school curriculum which the trainees will use to teach, and we have experience supervising them as they teach, and we also interact with the course outline provided by the university which we use to teach. The university does not have that constant relation with the primary school curriculum or matters that concern its teaching. So, from where we are, we are dealing with these two sides and so our input cannot be discounted. I don't see how people will meet and make changes to the curriculum or restructure it and leave the enforcers out. So, whenever a curriculum innovation or reform is to take place and those who are at the forefront of implementing and supervising are not involved, there will always be a problem. (Ray: 42-44)

> "I have never been invited to participate in curriculum review or innovation in all my 11 years of teaching, and we are those on the ground, so if you are at the top and doing things without including the teachers, are you doing it for yourselves? If is for the trainees, we teach why not involve us? If we are involved in a programme, we would be more committed to it because we are a part of it. But I think sometimes is because they want the money to themselves, so they organise themselves, do anything and bring it for us to teach which is very bad. And do not even follow up to evaluate course they bring for us to teach, how do you do that? And it like we are all deceiving ourselves. The problem is that if they do it at their level, it would have no impact, they need to involve those at the impartation level, that is the teacher to make whatever programme they are planning rich with their experience. (Frank: 41-44)

> "I have not been invited for any curriculum development or innovation. Teachers know the needs of the students and have been interacting with them year after year, we are those 'down there' and yet we are not included in an important exercise like this. They sit up there and decide what they think should go into the curriculum without our inputs. If they do not want to directly involve us at least after they are done with the draft, they should send it to us for our input. The reason why parts of our education is staggering is that the implementers of most of the educational programmes in this case the curriculum are left out of the process. Then they come and dump it on you to teach. So, the way they may want you to approach a topic or what they want the student to get from that course, you the teacher may not know." (Connie: 36-39)

King and Ray stated that in rare cases where they have been invited to take part in curriculum development, the organisers already had a plan they were to follow, and their inputs had to be tailored based on guidelines they were given. King for example stated he only got to attend such a program because his superior was willing to involve him. On one such occasion, Ray recalled they seized the opportunity to tailor the curriculum in line with

what was taught at the basic school because, the basic school curriculum had earlier been restructured without subsequently changing the curriculum for CoE.

> "I have had the opportunity to be part of the recent is designing environmental and nature studies curriculum for early childhood students for colleges, but the organisers have their plan, so they will request for your input, but you must tailor your input based on the guidelines they give you. I would have wished to do more but like I said they hardly do, I got to attend this through the invitation of my chief examiner. So sometimes is about who's willing to involve you." (King: 33-34)

> "I have been involved in curriculum innovation twice 2014 and 2015. It was organised by the institute of education at the UCC, they wanted to cut down on the hours trainees did on courses to acquire a diploma because they were doing more hours than normal. We were called to take out some of the things that were not too necessary. In fact, that even gave us the opportunity to review the content of the social studies curriculum because they had earlier on taken out ES from the primary school curriculum and replaced it with citizenship education without reference to the colleges of education, to train students to be competent enough to teach the new things in the reform and so we took advantage of the opportunity to tailor the curriculum to be in sync with it." (Ray: 40-41)

8:1:1:3 Challenges

Participants recounted challenges they have encountered in relation to teaching EE which included; students wanting to know more than the curriculum specified, logistics and time constraints, qualification of teachers teaching EE and students background knowledge.

8:1:1:3(a) Students Want to Know More

Participants indicated that, although students were not too eager to study what would not be examined, students usually wanted to know more than the curriculum made provision for. But they indicated that they only digressed into incidental teaching if they perceived that what students wanted to know was important. Thus, the decision on what was important lay within the bosom of the individual teacher and their perception or weighting of its importance. There were several reasons why teachers did incidental teaching. For Ray, students "felt a connection to the environment" and wanted to know more and for that reason he taught outside what the stipulated curriculum (Ray: 38). Connie said it was to "beef up student's knowledge" (Connie: 34). Milli had a rather personal reason of being "troubled when EE topics were taken out of the

social studies curriculum" and said there was the need to teach extra, so students appreciate the environment (Milli:10 -11,27). Jane and Aha mentioned that teaching EE was not limited to the classroom and that they addressed such issues out of class as well when students confronted them. Aha went on to suggest that curriculum planners need to "do a lot more to address these inadequacies" (Aha: 40-41). While Connie engaged them in projects to take care of such needs, Ray referred students to other sources such as the internet or gave them assignment on such topics. Some participants rehashed the fact that within all these digressions, examination would have to be considered and if one dwelled too much on what students wanted to know, the students may fail their exams and so regardless of what students wanted to know, they were always guided by examination demands.

> "4 times out of 5 students usually want to know things outside the curriculum. We go the extra mile to teach them when they need to know something outside the syllabus, but we prompt them, that it is for their own studies and not for examination. It is not something that they will assess them on that. Sometimes I address some while teaching, sometimes I take it as individual differences that I meet them and discuss one- on- one and we share some few thoughts and ideas." (Jane: 28)

> "There are a lot of things students wish to know about the environment that can take you away from the curriculum and if you are not careful, you will be swayed to teach other things. Today for example, I was teaching radiation [solar and terrestrial]. The students had no clue and I had to veer off to explain terrestrial radiation to them but in basic form and that took some time off. Others then wanted to know more but we could not proceed. But there are times that what they need to know is so essential that, I do take time off to educate them. These are the challenges. Sometimes I refer them to internet site or some books for further reading." (King: 36-37)

> "It is interesting, the students contribute a lot during lessons, the students are interested in the topics and sometimes ask to be taken out for excursions to see some of the environmental degradations and others that are mentioned during lessons. There are times students push for more, sometimes they even suggest we go on field trips to see what we are talking about, but we are restricted by the curriculum. Sometimes when I can make time, I try to but most of the time I stick to what is in the curriculum." (Vera: 28-29)

> "…and so, modifications would be proper in as much as it benefits the students. But when you do that, then you are taking a risk of your students not performing well in the external exams, so that is the danger. But sometimes there is what is called incidental teaching such that when such things crop up you take the opportunity to give the students the needed exposure. But the degree to which you can do it is limited because it is not part of

the syllabus, yet it is very critical, and you need the students to have such information. So, from time to time when such issues crop up we try to address them." (Bob: 37b)

8:1:1:3(b) Logistics and Time

Other challenges identified by participants were time and logistics constraints. In terms of time, teachers indicated that time was of essence in completing the course outline and this led to use of lecture method to teach and "limiting lessons to classroom" (Josh:43). Bob noted that students appraised teachers at the end of each semester and to score high marks one needed to have completed the course outline. Some participants said due to time constraints, practical or project activities could not be organised. Although Josh noted that students were passionate about, loved to learn and were eager to make contributions during lessons on the environment, time limitations did not permit them to, and as Ray put it, "the curriculum is already loaded" (Ray: 14). Although some participants admitted that projects and hands-on activities were very good ways of learning about the environment, they indicated that there wasn't enough time to do that and students complained when time meant for other subjects were used for other things. Another challenge identified by participants had to do with teaching learning materials (TLMs) or resources (TLRs). They specified they sometimes had to use their own resources in buying TLMs for lessons which makes teaching difficult. Here are what some participants said;

"…students take keen interest in it and love it a lot, except that they are not given enough room to learn about it but whenever it gets to EE, they contribute a lot, they share their experience …it all boils down to time. I would have wished to engage students in something like that (projects) but time would not allow me or let them. The college system is such that, all the time they have something doing, the subjects are many, is not only science, so if you give them a project which requires the use of time not allotted to science to do it, they may complain. So, you are compelled to limit them to a classroom situation. It is very difficult to give them a project that will take them outside the classroom because they would complain that another course would suffer. So, most of it is theory and issues relating to what they would do in a classroom situation. (Josh: 36, 45)

"Yaah! Errrm! To be honest with you with practical activity, sometimes we lack those ones, not even sometimes we don't really do much practical work, the reason being that most of these colleges, their science labs there are few, we lack so many equipment, we lack so many things and errrh! Some topics that involve improvisation really helps but

> with E. science, is more of field trips, is more of sightseeing ahaa! So, we lack some few things over there. In addition, they are not examined in practical at all in the external exams." (Jane: 38)

> "Teaching learning materials. Sometimes they are very difficult to get, yesterday I went to Madina (a suburb of Accra in Ghana) to buy my own map because I was going to teach something on maps, and I wanted to get a map to let them know the features of a map and the rest. Am teaching something on the globe, I can't find it, so I use an orange and mark it to show the two different rotations on it as well, so you realise that the TLMs is one major aspect and it makes teaching challenging in the school." (Milli: 56)

Connie mentioned that infrastructure was a challenge and indicated that there were larger class sizes and small classrooms. King recounted when he was stopped from proceeding with an organised field trip at the last minute because there were no female teachers accompanying the students, he explained that those teachers couldn't simply make the time and so the trip was cancelled. This, he explained can be very disappointing and does not encourage the organisation of such trips in the future. Aha noted that, the process of organising educational trips is sometimes so cumbersome it puts teachers off.

> "Some of the challenges include TLMS, we must improvise and large student numbers against small class sizes." (Connie: 32)

> "…there are also institutional bottle necks. Sometimes we need to go of field trips and is difficult because it eats into the time of other teachers and so it's difficult, even when you have taken the initiative so it kind of kills your interest and next time round you would not be encouraged to do it." (King: 30)

> "Sometimes some topics demand that you go on field trips and the facilities to do that are just not available. Sometimes the sheer thought of what you must pass through to secure permission for these trips puts you off." (Aha: 39)

8:1:1:3(c) Teacher Qualifications

Milli and Aha noted that teachers of other subject areas were recruited to teach EE, lamenting that these teachers have no clue as to how to teach EE. Milli specifically mentioned Physical Education (PE) teachers teaching EE aspects in social studies. Vera suggested that teacher qualification and competence to teach EE needed to be addressed otherwise those with the expertise to teach EE would be overlooked and not employed.

> "Another big challenge is the calibre of teachers we pick to teach environmental and social studies. A teacher of this course you would expect should have a qualification like B.Ed. social science or closely related course, but then here you have teachers of P.E teaching EE course and I feel what they do is reading to teach and have no clue about the practical aspects of the course because they do not know which aspects of the topics need practical attention. Someone did business administration and is teaching E. science." (Milli: 58)

> "Sometimes you go to some of the colleges and you realise that the teachers who teach some of the courses are not that qualified to teach" (Aha: 29)

> "We need to look at tutor's qualification and competence of teachers to teach certain courses and certain subjects. Otherwise people who are well equipped to teach certain aspects of courses or topics will be overlooked…" (Vera: 26)

8:1:1:3(d) Students Background

Ray and Frank talked of student's background and how it affected EE. They noted that most students' background was related to the economics aspect of social studies which made them uncomfortable when introduced to environmentally related topics which had more geography related topics. But Frank was more concerned about students' attitudinal backgrounds which bordered around students' general conduct to lessons, including lateness, lack of interest in lessons and absenteeism.

> "… for a course like FDC 118 which is Social Studies and Human Land Issues, most of the topics are looked at as geography courses and most of the students who come here do not have that background, they have a background in social studies because it is a core subject at the SHS level and a lot of them also have background in economics, so they are more comfortable with economics related, history or language related courses so they are not comfortable initially when they are introduced to environmentally related topics more so when these topics are more geography inclined in nature." (Ray: 36-37)

> "Teaching and learning materials are not readily available, and then we have student's attitudes towards attending lectures (lateness, absenteeism, lukewarm attitudes, students sneaking out during lectures and all that)." (Frank: 38)

8:1:2 Main Theme Four: Perception of Environment and Environmental Education

This main theme discussed participants perceptions of the environment and the practice of environmental education. In all there were three themes and eight sub-themes. The themes included participants' perception of the environment, perception of EE and the approach EE

should take. The subthemes shown in Figure 8.2 below provide further illumination of the themes and the main theme at the micro level. As with the previous themes, verbatim quotes from participants transcripts are used to support the report.

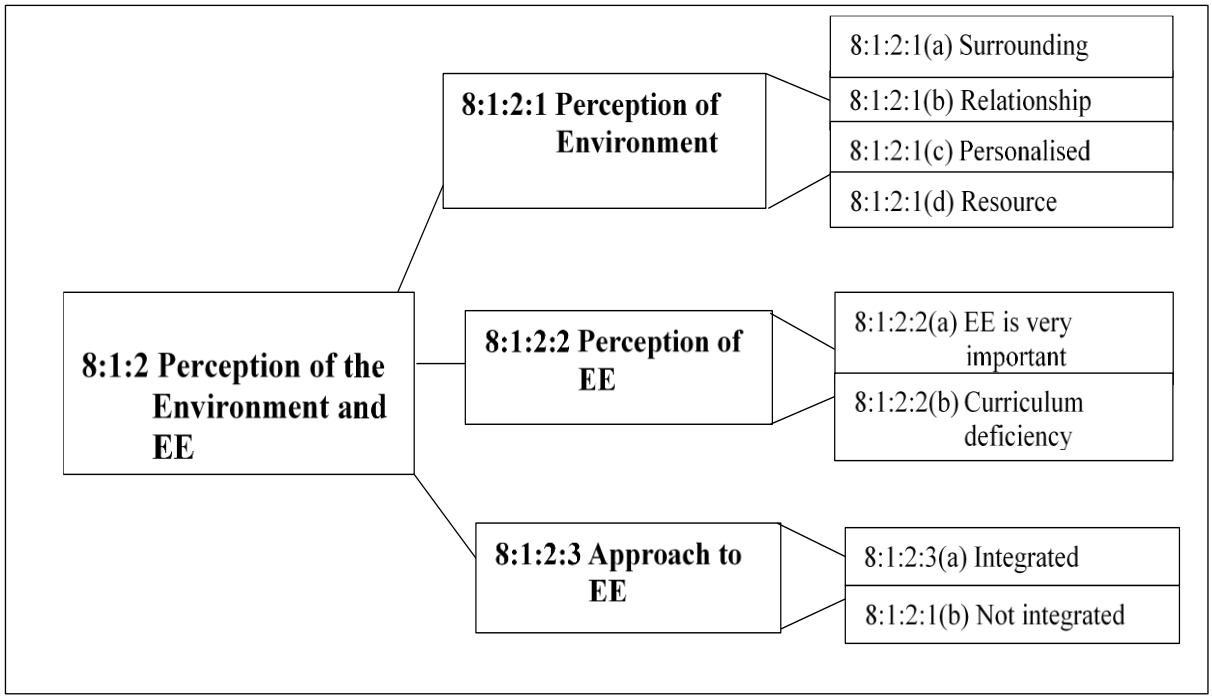

Figure 8.2: Themes and Subthemes on Perception of Environment and EE

8:1:2:1 Perception of the Environment

The environment is viewed differently or perceived differently by each person based on our relation to and experiences of it. It was important to find out participants perception of the environment, after all that is what they teach or are supposed to teach and what they think or perceive the environment to be will affect how they relate to the environment themselves and the importance they will attach to EE and their practice of teaching (Esa, 2010: Yero, 2010; Sund and Wickman, 2008; Shuman and Ham, 1997; Iozzi, 1989). Participants responses identified four unique ways by which they perceived the environment; as a surrounding; a relationship; personal and as a resource.

8:1:2:1(a) Surrounding

Some participants described the environment as their surroundings or everything around them, which included both natural and artificial things, but conspicuously missing was humans. Beyond this, some did not indicate another perception held about the environment. while others having indicated the environment as just made up of one's surroundings went on to state that caring for or destroying the environment will have a personal effect as well as affect future generations as seen in the following quotes;

> "Environment is all the surroundings within which we live in, including trees, all-natural things that we can find in our neighbourhood and then the surroundings" (Jane: 4)

> "My surrounding, I would say my surroundings and all the physical things that pertain in it, both natural and artificial and if I make good use of it then in the end it would be profitable for me and would be in continuous existence for future generations. But if I destroy it now generations yet unborn, will suffer…. (Milli: 4)

8:1:2:1(b) Relationship

Relationship with the environment was seen in two ways. In one-way, it was a one-way relationship in which 'the other things' in the environment influenced humans either directly or indirectly but not of humans influencing 'the other things' (Josh: 4), and in another way, it was seen as a two-way engagement of humans influencing and being influenced by environmental factors including other humans. Participants stated that because of this relationship with the environment, discussions on the environment are always present (Josh: 36; King: 51).

> "Everything in the surrounding that influences me as a person, including any living thing and their surrounding which has a direct or indirect effect on the survival of the organism. So, my environment is everything around me, living or non-living which influences my survival" (Josh: 4)
> "I think the environment is all elements in nature which affect all organism and are intend affected by organisms. So, it is not just about things around us, but we are very critical components of the environment itself." (Ray: 4)

> "The environment is part and parcel of man, without the environment, we cannot live. The environment is everything around us." (Aha: 4)

> "The direct relationship between the environment and human beings make it easy to find

reasons to have continuous discourse with students." (King: 51)

8:1:2:1(c) Personalised

Josh mentioned a passion for the environment which resulted from knowing the relationship between the environment and human's survival and the threat on human's survival caused by a surge in unsustainable environmental activities. Frank who aside indicating the environment meant a lot personally, stated that life is affected when the environment is degraded. To Connie, the environment is life and humans will cease to exist without the environment and so the environment needed to be taken care of. This sounded like a personal obligation to this participant who said; "…Without the environment, I cease to exist and so, I need to take care of it." (Connie: 4). Vera indicated that humans have only one Earth and so EE should be given the needed attention to ensure a safe and sustainable environment. Milli also shared a more personal sense of environmental attachment stating times when it was necessary for her to literally tap people and prompt them to pick up rubbish they had dropped, which the participant indicated brought a feeling of "…turning myself into a different person…" (Milli: 9). Below are what some participants said:

> "I am passionate about the environment knowing how important the environment is to the survival of man and knowing how environmental issues are becoming global issues today and fast rate at which environmental issues is catching up with man and man's survival" (Josh:28a)

> "The environment means a lot to me. If we degrade the environment, it affects our lives eventually if air is polluted, water is polluted, and sanitation is bad and so on." (Frank: 4)

> "…We have only one environment and we need it for ourselves and for future generations. We need to conserve whatever we have." (Vera: 32b)
> "… I remember when I was teaching it, I got to Makola (central market in Accra-Ghana) and I felt so bad, looking at people drinking water and throwing the empty sachet of plastic away. Sometimes I have to tap people and say, "go back for the rubbish, go back for this" so I realised that I was even turning myself into a different person while going to buy things" (Milli: 9)

8:1:2:1(d) Resource

Some participants saw the environment as a resource to cater for human needs. Although Bob stated that as man takes, man should be mindful of future generations (Bob: 6), he nonetheless was of the view that man can extract and exploit to live more comfortably. The relationship in this case was one in which the comfort of man is tuned to the environment in such a way that, the environment becomes the 'giver' and man the 'taker'.

> "There are so many things we get from the environment like all-natural resources by their extraction and exploitation we can live and even make our lives comfortable. So, without the environment and its resources man cannot live… we hunted for little animals, picked fruits and so on, so you could understand nature gave back something" (Bob: 4; 53)

8:1:2:2 Perception of Environmental Education

This theme reports on how participants viewed or perceived EE. Participants generally saw EE as very important and gave reasons why they thought so. They also stated what they perceived as curriculum deficiencies and these are further captured in the report that follows.

8:1:2:2(a) Environmental Education is Very Important

Participants perceived EE as very important in producing behaviours that were environmentally friendly and particularly for trainees because they would be teaching generations upon generations. Participants stated that EE first equips trainees with the requisite knowledge, skills, desirable attitudes and values to be more aware of their environment, act in environmentally sustainable ways and create sustainability awareness among people in communities where they will live and teach. They also mentioned that this would bring about transformation in children who trainees will encounter. The importance of EE in colleges of education was thus seen in three folds: first education of the trainees themselves; then education of people in communities where trainees live and work in and education of students they will encounter year after year (Bob: 6-8; Jane:6; Josh:18-19; Ray:6; Frank:6; Milli:6-7; Cinnie:6; Vera:6). These views of participants are summed up in the quotes below;

> "Environmental education is very important in teacher education because if teachers are given that kind of education, they themselves will acquire needed knowledge, desirable attitudes and values to be able to come out and became competent people who can help create awareness in people to live a sustainable kind of life so that they would have the mind-set that as we extract things from the natural environment we should be mindful of future generations. So, if they know these dynamics, they will come out of training having positive attitudes towards the environment. Again, the teachers are then well equipped with EE to be able to impart to the children they will be teaching and that will help to transform the lives of so many people, because thousands of children will pass through their hands. And thirdly, the teachers are not segregated from the society, they are part and parcel of the society so when they are educated on the environment which ever community they will be working in, they will help transform the lives of the people there with regards to environmental awareness and positive attitudes towards the environment. There are instances where teachers are posted to communities and they transform the lives of people in the community regarding several things based on education they the teachers have had." (Bob: 6-8)

> "It is very important because EE is about the human being and all that they do to survive and right now majority of the problems we have are environmental issues relating to how humans treat the environment. The air we breathe, water bodies, etc., they are under serious threat and, so I believe that given information about EE is very perfect because we are training students who will also go out there and train so, if they are environmental educated and they go there and young as the pupils are they can pick the concept right from the word go, I believe it would be very helpful for all of us." (Ray: 6)

> "EE is very, very important because if you look at the modern lives that we are living so many issues go against the environment such that if the colleges of education inculcate much of EE into the curriculum it would spew of to the basic level and the children will grow with environmental consciousness starting from the basis, primary school, JHS and up but because is given little emphasis here when the teachers go to the field you can see they don't even also emphasise EE much and so the children grow up not appreciating the environment much and is replicated in their behaviour" (Josh: 6)

Some were also of the view that the importance of EE is hinged around the fact that the environment ensures human survival and less emphasis on EE would endanger lives and hence the need for educating "our youth" on the environment (Josh: 18). Participants also opined that nature was gradually being lost, there was no concern for the environment, there were many environmental problems plaguing the country and that human survival was being threatened and so, called for a concerted effort by stake holders, researchers and institutions to work towards improving the environment. Participants again emphasized that EE should start from basic to tertiary level and specified that it will take environmentally educated teachers to teach

EE concepts at the basic level (Josh:6, 18-19; Frank:6) and to affect even the Ghanaian economy and bring change to others in the community. Below are what some of the participants said;

> "We should be seriously worried because the environment is everything that contributes to the safe survival of man. So, if less emphasis is given to EE, it means we are equally endangering our own lives. So, we should be thinking of how to create in our youth the love for the environment, how to protect the environment, how to preserve what is there or even if possible, how to get back what we have lost. Many animals have gotten extinct…forests are being wiped out, if not for few conservation centres, I wonder where one could go in Ghana here to see a lion or an antelope. So, we should be worried that we are losing nature, important natural resources because the environment is not treated with much concern and as we are losing these things, our own survival is being threatened. So is a great worry and I think policy makers, research institutions, and all other who have concern for the environment should take it upon themselves to improve on our environment and by so doing improve on our own lives and survival." (Josh: 6 18 -19)

> "Looking at the environmental problems we face, like environmental degradation, air pollution, land and water pollution, EE is important. It's something that we must be serious about. If the environment is polluted, there are environmental kickbacks like diseases such as cholera, malaria and so on and we need to do something about it. I think we should look at it from the basic to the college level so that when the students are equipped upon completion, then they can impart to the basic level and gradually we will be heading towards getting a solution to some of these problems." (Frank: 6)

> "Well to me EE is very important because looking at the economy even Ghana, Ghana is such that you find people throwing rubbish around anyhow, defecating anyhow and a lot of things, but when you inculcate this idea into the children giving the children the values, the attitudes with the environmental studies then in a nutshell when they are for example in a vehicle and they see people throwing sachet water away, they will be able to tell the person "please, no! This is not good, put it in the bus" then they know because then you have been able to inculcate the values into the person (Milli: 6-7).

8:1:2:2(b) Curriculum Deficiency

Participants generally thought of the curriculum as being deficient and that's what prompted them to identify what needed to be addressed in the curriculum (see section 8:1:1:2). Participants noted that the presence of anti-environmental behaviour was evidence of a deficiency which pointed to the fact that education did not embody much of EE. They were of the view that if EE was lacking at the initial teacher training level, by implication it was lacking at the basic level and so people will grow with little EE which reflected in how they treated the environment or related to it. But they perceived that if EE was given more attention, students

would take it very seriously, this they said would be possible if EE were made a major part of the curriculum. Participants were of the view that once the curriculum makes provision for EE, it would be easy to discuss such issues in and out of class since students live and participate in such issues or encounter them and such relationships provide a platform for continuous discourse with students. Some participants also mentioned that when the course involved more of environmental science in time past, participatory pedagogies were used, and students appreciated environmental problems but all that is now reduced to classroom work. Some worried that the battle with environmental problems was because a lot of people did not have EE early enough. Others stated that more practical experiences should be preferred to concentration on passing examinations (Ray: 24, 27; King: 50-51; Frank: 6; Vera:7, 10, 32; Josh:7,29,37). Below are quotes from some participants:

> "So, you see littering, poor sanitation practices being part of educated people in the society, that tells you that people have had formal education and yet don't have any considerations for the environment because there training did not embody much of EE... But when that thing is lacking at the college and for that matter lacking at the basic level, people will grow and branch into their various professions with little environmental education and it is reflected in the way we treat the environment…So, I can see that when is given more attention, the students will take it very serious and I would not doubt that it would be replicated whenever they go out to teach. Then we can succeed in our battle to improve on our environment. I have noted that if we give EE the needed space in the curriculum, students will learn it and apply it." (Josh: 7, 29, 37)

> "I think we should be worried about the way EE is set out in the curriculum, we should be, we should be, because as I mentioned earlier environmental education should be given its rightful position. It should be a separate course and time allocated for it. We are swarmed with so many environmental issues the world over and even in this country such that the earlier we start giving EE the needed attention, the better." (Vera, 32a)

> "My students live and participate in environmental issues, so it is easier to discuss environmental issues in and out of the classroom once the curriculum makes provision for it. The direct relationship between the environment and human beings make it easy to find reasons to have continuous discourse with students." (King: 50-51)

> "We should reduce the number of times we write examination in a training institution. For proper training, students don't have to write too many exams, so that you give enough time for practical experiences." (Ray: 24)

8:1:2:3 Approach to Environmental Education (EE)

The responses of participants on this subject were mixed. While some thought EE should remain integrated, others said it was better to have it as a separate subject, while for others it could be taught as a separate course while it remained integrated into other subjects. Yet for others, the answer to the success of EE did not lie in integrating the course or teaching it as a stand-alone, but in giving trainees the needed knowledge, skills and exposure for action and to impart to children.

8:1:2:3(a) Integrated

For those who advocated that EE remain integrated, they were of the view that making EE a separate subject would mean more work and creation of extra teaching time on an already crowded school timetable and so, integration of EE was the way to go. Frank stated that if EE is to be a subject on its own, those involved in curriculum development should be committed to it. Others were concerned that students will complain of yet another subject to study and rather suggested that, the integration should be comprehensively done from the basic level.

> "Well, (hesitates) I would welcome an introduction of EE as a subject in Ghanaian schools, but they should be committed to it. I believe what is there is enough because adding more means more work. So, what is there is enough instead of adding more and not getting time to do it. I think the integration is good… First history, geography and economic were taught separately but they decided to integrate them, and I think that is the way to go, instead of treating one topic in-depth when it doesn't solve any problem." (Frank: 20-22)

> "I think if it is to stand out as subject, the students will complain about being overburdened because already they complain about studying so many subjects. To me it can still be an integrated aspect but then it should be covered comprehensively. So, I think the environmental issues can be integrated into science right from the basic school and dealt with very comprehensively." (Aha: 14 -16)

> "Humm! At the college level, I wish it would remain as such, it may be found in the sciences and other subjects, mind you it may be integrated but it stands as a subject on its own. You have topics that have the same theme with EE or environmental science borrowed and bought into the Social studies in other to explain issues or solve problems better. If anything at all, we can let it permeate into other subjects like maths and so on." (King: 20)

8:1:2:3(b) Not Integrated

One main reason some participants gave for suggesting that EE be made a stand-alone subject was to give it space and time on the curriculum for proper expansion of the course content and teaching (Josh: 21, 25-27, Vera:17,19; Connie: 13-14;). To these participants, trainees are not well prepared to teach EE because EE is fragmented mainly into social studies and science courses and so does not address current environmental challenges in its current form. In addition to not preparing trainees well, some participants opined that trainees see EE as a small aspect of science due to how it is integrated and taught and that if EE is made a separate subject, methods and pedagogy of EE would then be taught. Note that participants earlier stated that pedagogies used to teach EE are pedagogies used in teaching the main courses into which it is integrated (see section 7:1:2:1b). Others thought it could be a stand -alone subject but still be integrated into other subjects (King: 20; Ray: 26).

> "If Environmental studies was to be a course on its own, it could have been given enough time on the time table to be taught but because it is added to Biology, it doesn't give enough room for interaction, just a small aspect of it is emphasised in the curriculum, so I would say is not enough at all in the college curriculum. I think the integration is the problem because if it was to stand out as a course, it would entail more aspects of the components of E. science. Is not given enough space in the curriculum. So, this arrangement of it not standing on its own squeezes it and not much of it can be taught. So, the key problem is it not being a separate course and being integrated… Not much, because it is integrated in science. The way we teach them is the way they will teach it at the basic level and right now they think environmental education is a small part of science. If EE is standing as a course, it means that all the necessary methods and pedagogy needed to teach it will be researched into and be taught. Right now, is only methods used in teaching science topics that are being learnt by the students because EE is incorporated in science but looking at the critical position that EE occupies it need to be given its own attention and appropriate methods of handling it. (Josh 21, 25-27)

"And I think we should be worried because the environment is life and there are a whole lot of things to be learnt in there and, so, it should be a course on its own to afford it the space to be taught and assessed properly. Currently assessment is only on the cognitive aspect. Once students can recall facts, they can pass their exams and the other aspects of building attitudes and behaviour modification are left out. Practical wise, students are nor engaged so they are not examined in that aspect. (Connie: 13-14)

"In addition to EE being a separate course, EE should be made to cut across the curriculum.

Every subject should as and when it provides the opportunity include element of EE. If a concept is learnt in maths how would that help improve the environment? English language passages can address or educate students on the environment and so on. Elements of the environment can be factored into all subjects. Because the world is grappling with issues of the environment more than any other thing in my estimation. If we use resources anyhow without the environment in mind, we would be overtaken by events in our quest to develop (Ray: 28)

While some participants aligned with integrated or not integrated approaches, others did not pitch camp. To them, what mattered was that the course should be structured in such a way and with such content that trainees are given the needed exposure, knowledge, skill and imbued with positive environmental behaviour for action and to impart to children.

> "I don't mind the form it comes in as long as it addresses the issues that should be addressed to give the trainees the needed exposure they need to have good environmental behaviour and practical know how to impart to the children they will be teaching." (Milli: 39)

CHAPTER NINE

LOCATING RESEARCH FINDINGS WITHIN WIDER CONTEXT

This chapter discusses findings reported in chapters seven and eight. I first related findings to Bourdieu's Social Practice Theory (SPT) which guided this research and discussed the implications. The second part related findings to other research findings and literature and again discussed the implications.

9:1 Locating Research Findings Within Bourdieu's Social Practice Theory (SPT)

In chapter 5, I indicated that Bourdieu's practice theory is hinged on a quadruplicate concept of habitus, field, capital and practice. He identifies these concepts as elements of a framework that discuss and explain human interactions at individual and social levels. Although these concepts may be used in isolation, Bourdieu and Wacquant (1992, p. 96) explains that "such notions as habitus, field…can be defined, but only within the theoretical system they constitute, not in isolation". So, although I have attempted to explain how each of these concepts were operationalised in the findings, one can easily notice the interconnection and overlap between these concepts.

9:1:1 Habitus is Developed

Participants recounted experiences they encountered growing up, which shaped their perceptions about and actions towards the environment (habitus). These depositions were developed from home and the wider community including the school (fields). Findings indicated that participants' background, knowledge acquired or not acquired, family's social standing, as well as the environments they grew in and networks established (capital) affected their perceptions, actions and teaching (practice). For example, Jane's grandfather had knowledge about conservation practices (capital), which was passed on to Jane at home (Jane: 42 -43). Compare this to Bob, who grew in a community where clearing trees for farming and

charcoal burning was normal practice (Bob: 53). This finding also relates to Heidegger's concept of *Dasein* or being thrown into the world (see section 5:2) because 'where one is being thrown' (born and raised) can determine to a large extent the capital and habitus one acquires and develops.

9:1:2 Habitus Influences Perception and Action

According to Bourdieu and Wacquant (1992), habitus tends to persist and resist change. But they indicate that, it has the potential to influence our actions and construct our social world (Bourdieu, 1984) and that these depositions, shaped by past events and structures which in turn shape current practices and structures, condition our perceptions of such experiences and gives us hints to respond to practices of similar characteristics should we encounter them in future (Bourdieu, 1976).

Early experiences of participants persisted and resisted change in some instances (see section 7:2). Some participants for instance, indicated that, they still believed in traditional environmental beliefs and practices (TEBP), while others did not believe in them anymore (see section 7:1:2:3). So, there must have been a kind of education which reinforced their beliefs or rather an education which did not give them cause to dispel these beliefs as occurred in other participants. In some cases, the Habitus influenced participants' career choices, perception of the environment and teaching EE, classroom interaction with students and what they perceived to be knowledge deficiencies of trainees (see section 7:1:2:3). These affected their overall perception of EE and actions they took during teaching as well as solutions they proffered. For example, Josh admitted he encountered little EE at the basic level (Josh: 67) and suggested that EE starts early at the basic level, so that children grow with environmental consciousness. He also stated that EE should be taken more seriously and expanded to cover more issues (Josh: 41). So, in other words, Josh's experience informed his perception of EE and what needed to

be done. Similarly, Milli stated that she did not encounter much EE during her education especially in preparing her to teach, and worried that trainees were not being prepared well to teach upon completion (Milli: 46-49). To her, EE was not well structured in the curriculum and was "going off track" (Milli: 28). This informed her action of "trying to put in something small (teach) outside the curriculum to help students…" (Milli: 27).

9:1:3 Habitus can be Modified or Re-educated

Although the Habitus is resistant to change or tend to be persistent, Bourdieu and Wacquant (1992) agree that, the habitus is not fixed and can be modified. For example, some participants agreed that the fear factor and faith in TEBP kept these practices alive and for good reason but insisted that children now be given "scientific reasons" and "academically inclined conclusions" on why such environmental practices were important as indicated in section 7:1:2:3(a). This seemed to suggest that, the reasons given by indigenous people which these participants held on to and believed during their developmental years, no longer applied in their estimation. In other words, their habitus had been interrupted, modified, re-educated or influenced by experiences which occurred between the time they held those perceptions, believed in them, acted to sustain them and 'now'. Where exactly the re-education of the habitus occurred was difficult to figure out for all participants, but Frank (56) believes early school did not do much to expel these beliefs and according to (Josh: 67), much of EE both formal and informal, was not received until tertiary level.

Bourdieu and Wacquant (1992) further indicate that, individuals in a field may change their previous habitus to respond to the needs of their new environment (Field). For example, and in relation to their classroom experiences, participants soon realised that participatory pedagogies which they previously used in teaching was simply time wasting, as it did not benefit students in passing their exams which was what the college (field) expected practice to achieve. Most

participants had therefore with time, changed their practice of such practical approaches to the lecture method of teaching and assessment, which ensured that course outlines were completed on time and that trainees were prepared for examination (see section 7:1:2:1). Thus, the rules and expectations and or requirements that pertained in the field in turn shaped or modified their habitus and practice.

9:1:4 Sustaining the Habitus

Habitus is "embodied in one's history" (Bourdieu 1990, p.56) and so previously acquired habitus may be brought to a field, but this may or may not be useful in the new field depending on the practice in the new field. For example, participants indicated that they relied on some of their experiences in their practice of teaching (see section 7:1:2:3 a and b). These habituations and or experiences of participants were useful to the field and thus were welcomed and sustained. But there were other experiences that were not sustained by the field. For example, Josh and Vera stated that despite having broad knowledge and experience in EE at the master's level (capital and habitus), the college curriculum did not create much 'space' for EE and so with time the training they acquired in respect to teaching EE becomes irrelevant. Thus, this aspect of participants' training, experience and knowledge was not useful to the field and hence was 'not exactly useful' at least within the context of the field where they operated or practiced at the time. This struggle between what has been accumulated through the individual's experiences or habitus and what is expected or pertains in the field of practice (Bourdieu 1976), led to some participants teaching outside the curriculum while others 'fought' with the curriculum.

9:1:5 Capital Varies

Although all participants had the required qualification and certification in Science or Social Studies to teach EE at the college level. Findings revealed that these forms of capital varied and

affected how participants taught lessons and or valued themselves as being competent to teach EE or otherwise. Although most participants rated themselves as Very Good and Experts in teaching Environmental Science or EE (see section 6:4), findings revealed that some participants were not sure of their competence to teach, due to the kind of professional training (capital) they had acquired. (see section 7:2:1:2). Despite having the appropriate qualification and certification (institutionalised capital) to teach EE, some participants indicated that, their institutionalised capital was not relevant to what they taught. For others, the absence of TLMs (objectified capital) made teaching and learning difficult (see section 8:1:1:3b). In this study, participants drew on social capital time and again. For instance, Frank had help from resource persons (Frank: 56). King was assisted by colleagues to organise educational trips (King: 30) and was invited to workshops because of his relationship with one of the organisers (King: 34).

There was also variation in types of cultural advantage or disadvantage participants encountered. For example, while Bob recounted absence of toilets in their locality, making open defecation normal practice in his early years (Bob: 53), Vera stated that though not common, they had a toilet in their compound (Vera: 6). So, in terms of capital in environmental positive behaviour at that time of their development, Vera was arguably on a higher pedestal than Bob. If these two children were in the same class, they will have different perceptions of sanitation at least with regards to open defecation. These diversities will have to be accounted for when teaching children who undoubtedly come to school with diverse capital and experience but are expected to be taught to develop similar behaviour towards the environment.

9:1:6 Fields Overlap and Interact

According to Bourdieu (1990, 1993), fields can interact with each other and may also be subordinate to larger fields of power and class relations. Participants identified three fields where EE was encountered: home; community; and school. From participants accounts, what

pertained in the home in relation to EE was reinforced by both the community and the school and vice -versa and individuals in these fields acted towards a common goal. For example, although the school was a field on its own, it enforced traditional environmental laws just as the home (see section 7:1:1:1). Thus, in terms of 'power of fields' the home and school were subordinate to the larger community (Bourdieu, 1990, 1993). Power play and its significance in the home, school and community is worth noting. Participants were subordinate to and accepted what was passed on from members of the community concerning the environment, sometimes through their parents and did not question such knowledge or break such laws.

Participants in their recounts alluded to the existence of tensions both in their field of practice (within the college) and between their field of practice and other fields (Bourdieu, 1993). They identified administrative tensions (see section 8:1:1:3). They also mentioned non-involvement of teachers in curriculum development (see section 8:1:1:2c). Participants felt there were dominant field players (Bourdieu, 1993) who affected their effective functioning, relevance and input within the field. Bourdieu and Wacquant (1992, p.101) states that "every position, even the dominant one, depends for its very existence…on the other positions constituting the field". For instance, the position of a college administrator is held in relation to students, teachers and other staff who give that position meaning. The Institute of Education cannot develop a curriculum for colleges of education if colleges are non-existent, and so, these 'barriers of power' may need to be broken so that everybody feels the 'power shared' since the relevance and life of one field is sustained by the existence of other players and other fields. When people feel 'part of', they can then take 'responsibility for' and act in 'the interest of' that which they feel they belong to or are a part of.

In summary, the capital gained, and habitus developed from the fields of home, school and community shaped participants perception and understanding of the environment, as well as

their actions towards it. This habitus was reinforced by practices and beliefs that existed within these fields. As participants entered into new and similar fields and went through new experiences, they acquired more capital in these fields and new experiences which in some cases modified and or re-educated the habitus, which in turn influenced their perception and practice. However, the habitus was not modified and or re-educated in all cases, in some cases, it persisted and influenced participants' perception and practices as well.

9:2 Implications for Environmental Education

There are some implications of what has been discussed above to EE which is discussed in this section. One is that, the habitus is not 'born with', it is developed and to the extent that it is developed, it can be taught or not taught. So, there must be a conscious effort to imbue young children with what is needed to develop the behaviour or habitus which is desired. Also, the background of students and the posture of their various localities to environmental issues is worth noting to inform comprehensive EE. For example, if a community sees nothing wrong with open defecation it might influence the child's perception of that act and subsequent behaviour and attitude towards such practice. Again, habitus is developed through depositions, and persons through whom these depositions are made and who influence the development of the habitus (parents, teachers, and community members), must be well informed to deliver. Just as accurate environmental information and teaching can lead to positive depositions which can affect behaviour change, misinformation and lack of teaching can lead to forming anti-environmental behaviour.

Findings revealed that fields overlap, and so education which centres only on the 'school field' or formal education, may be less likely to succeed if the home and wider community are not involved in such endeavours. The primary contact of a child is first the home, then the child encounters others (in the community) before and throughout their schooling period. If the wider

community and the parents (adults) are not environmentally educated and or do not exhibit or practice environmentally friendly behaviour, chances that the child will be ushered into a kind of mind-set and behaviour which promote good environmental practices, would be very minimal or may not occur at all. Fields within which these depositions take place must also be well resourced to support such behavioural development. For example, in as much as the competence of a teacher counts in EE lesson delivery, the school must structure and provide resources and the necessary assistance to facilitate effective teaching. Again, Parents and other citizens must be environmentally literate, not only to act individually, but also to reinforce what children learn from school and vice versa. The wider community including faith-based organisations, community- based organisations, civil society organisations, media, and so on, must all be roped in and serve as watch dogs in promoting EE.

The implication of habitus being persistent and influential can be seen in two folds. First, teaching children to develop an 'environmentally friendly habitus at an early age may prove beneficial, as the habitus will be conserved as is its nature, and thereby, have a long-lasting effect on their behaviour and actions. Bourdieu states that "only the concept of pedagogic work can break the circle in which one is trapped when one forgets that a 'cultural need' is a cultivated need and best attained when it starts earlier in life" (Bourdieu, 1977 p.38). Secondly, education for older children and adults (teachers inclusive) whose habitus may need to be modified, interrupted or re-educated to learn and unlearn experiences that have long been ingrained in them must be done cautiously, since it may involve transformation of deep-seated habituations of mind and life and as such may offer a natural resistance to change. Re-education of the habitus will therefore entail gentle persuasion so that the "awakening of (their) consciousness" (Bourdieu and Wacquant 1992, P. 167) is not 'rude' but involve their desire to do so, which brings about the desired modification of the habitus over time. The ability to modify or re-

educate the habitus, provides an opportunity of influencing the habitus, which is a window of hope for individuals that have not developed an 'environmentally friendly habitus.'

Teachers' abilities which support learning must be harnessed, they must be encouraged and refreshed through CPD, curriculum development programs and involvement in other activities, even if extracurricular, to nourish and sustain them. If teachers are trained to develop relevant habitus and hence become competent in teaching what they are supposed to teach, then their habitus is sustained by and for the field. It is important that institutions preparing teachers to teach in colleges work in synergy with the institutions which design programmes for colleges of education to ensure that the capital accrued by teachers and the habitus developed becomes relevant to their field of practice.

9:3 Relating Findings to Literature

This section related findings from this research to other research findings and literature and discussed the implications for EE.

9:3:1 Personal and Classroom Experiences

This section discussed findings made in relation to participants' personal and classroom experiences.

9:3:1:1 Environmental Education in Traditional Beliefs and Practices

Findings showed that, participants received EE in the form of storytelling, proverbs, myths and other cultural practices (see section 7:2:1) which was how Traditional African Education occurred (see section 3:1 and 3:2). Findings also indicated a relationship between participants and the environment in terms of hunting, farming, planting trees, keeping the environment clean, protecting water bodies and forests, as well as observing other practices which protected the environment (see section 7:2:1:1a and 8:1:2:1b). A relationship with the environment as well as traditional beliefs and practices, formed part of the culture through which indigenous

Ghanaians sustainably managed their environment (Battiste, 2002; Boateng, 1983; Busia, 1967; Dei, 1994). There were mixed views on the present state of TEBP and EE. While some indicated they still believe in TEBP and their importance in environmental protection, others stated that these practices and beliefs have been overpowered by modern religion and formal education and that currently environmental protection or EE is likely to succeed using the avenue of formal education (see section 7:1:2:3). According to Acheampong (2010), TEBP are now regarded by many as fetish and useless, although they played a key role in environmental protection. Osei (2006) had earlier explained that, one reason for not considering indigenous African practices in the 'mainstream knowledge space', and regarding traditional environmental practices as fetish, is that African Traditional Religion (ATR) is not considered as one of the major or 'great religions' and therefore practices associated with it are unfortunately discarded as savage. This claim is evident in the Assisi Declaration of 1986, where ATR was ostensibly not considered as one of the major religions assembled to explore how practices of religions and or their influence could contribute to environmental conservation. Yet, existing literature indicate that environmental conservation practices existed over the years because of taboos and other traditional and religious practices associated with them and that the advent of notably Christianity, Islam, Western civilization and its accompanying technology has dented traditional environmental beliefs and practices and adversely affected the environment (see section 3:3). Contrary to claims by some authors (Acheampong, 2010, Dikirr 2005) of the disappearance of TEBP, this research revealed that some teachers and students still believe in TEBP and indicated existing chances of such education by learning from and using them to teach.

Literature indicates that there are instances where governments have taken away community land rights especially where there are natural resources within such lands (Chandrakanth *et al*.,

2004). In Ghana, the administration of land act- 1962, (Act 123) section 7 invests power in the president over stool lands in public interest, but despite the changing influence of chiefs in Ghana, Campion and Acheampong (2014) notes that over 80% of the land is under the control of chiefs and traditional rulers, and so while natural resource control and management are vested in the president, traditional authorities are the landowners (Sikor and Stahl, 2012).

Stool/Skin land is land that belongs to and under the administration of a community. The community will usually have a stool or skin as the traditional emblem of the soul of ancestors who originally settled in that geographical area and as such owned the stool or the skin. These ancestors may have settled in this area while hunting, searching for good water, fleeing for safety or searching for fertile land. The occupant of the stool or skin who is the chief and his cabinet, administer all the land in trust and on behalf of the people. The chief is also responsible for distributing portions of the land to members of the community and other developers who may not necessarily be natives of the community or part of the original settlers.

With the institution of state governance, however, some changes have been realised. Clause (3) of article 267 of the 1992 constitution of Ghana stipulates that any disposition of stool lands must be approved by the lands commission and must conforms to the approved development plan of the area concerned and that these lands are not to be given as freehold interest to both Ghanaians and non-Ghanaians (Gyamera, 2018).

The politics of authority over land and its complexities have led to land conflicts which have been battled between traditional settlement courts and legal courts (Ayee, 2003; Bugri, 2013; Tsikata and Seini, 2004), and this undermines the authority of the traditional 'land keepers' and their exercise of jurisdiction over those lands which give them control to enforce such traditional laws that protect the environment.

9:3:1:2 Issues of Sanitation

Participants mentioned that sanitation and other environmentally unsafe practices which they encountered growing up persist in Ghana (section: 1:2:3) or probably have become worse with increasing population which goes to show the persistence and influence of the habitus. According to Bensah, Antwi and Ahiekpor (2010), part of Ghana's sanitation problems is due to extremely poor toilet facilities especially in the towns and cities, a point which was also noted by participants (section 7:1:1:1a). Tamakloe, (2000) mentions deforestation (also noted by participants in same section) and urban sprawl leading to reduced land availability and increase in carbon dioxide levels. Findings indicated that sanitation issues in Ghana have political undertones and dimensions and that governments do not have the political will to address these issues head-on due to fear of losing their electorates. But this finding is not peculiar to this study and participants are not alone in this assertion, indeed some researchers (Ayee, 2003; Barry and Hughes, 2008; Chalfin, 2014; Cobbinah and Darkwah 2017) report that governments do not have the political will to institute policies and programmes relating to planning, water and other sanitation issues plaguing the country or to even enforce existing laws.

9:3:1:3 Socio-cultural Undertones that Affect Behaviour Change

Socio-cultural undertones are usually related to different people or groups of people in the society and their lifestyles which are influenced by their values, beliefs, traditions and their habits. Research has shown that such factors (both personal and social) can and does influence environmental concern and behaviour (Gifford and Nilsson, 2014). For example, in Ghana, where over 80% of the population does not have access to toilets (Water Aid, 2017), open defecation has become the habit of many and has been attributed to sociocultural and economic factors (Ameyaw and Odame, 2017). To illustrate this point further, a news report on TV3-Gh, a television station in Ghana on World Toilet Day in 2016, reported reasons why residents of

Chokor (a beach suburb of Ghana's capital, Accra) practiced open defecation. Reasons given by residence for open defecation included; distance, lack of access, unclean public toilets and lack of money to pay for use of public toilets, but when asked if he will patronise toilets if they are provided for free, one of the residents admitted he would not because, he enjoys the breeze while defecating at the beach (TV3 NEWS - Evening News Bulletin, 2016). This speaks to the behavioural tendencies of some if not most Ghanaians in terms of open defection, and gives the indication that for such a community, there are deep habituations (Habitus) that will have to be considered and re-educated or modified so that these individuals see the use of toilets as 'normal'. Note that participants stated that while growing up open defecation was normal (see section: 7:1:1:1). What is seen therefore as the norm of a community becomes ingrained in the individual, forming their habitus which informs their action. So, for such persons, the action of openly defecating is normal until there is an "awakening of consciousness" (Bourdieu and Wacquant 1992, P. 167) which will change their habitus and subsequently their actions.

Again, take a child in a fishing community who learns of the effects of using chemicals in fishing from school (which participants indicated should be added to the EE curriculum- see section 8: 1:1:2), such a child out fishing with his father or another adult, may find it difficult to tell his father or the adult that he will not pour a chemical handed to him into the water to kill and harvest fish or challenge the adult if he does same. Such a child will probably be described first as disrespectful, before the substantive matter of the act itself is considered, that is if he is lucky to escape instant hitting and being shouted at. This is because, in a typical Ghanaian community, children are expected to obey parents who are deemed to naturally know 'more' and 'better' than children. That is why the earlier call I made to co-educate the public alongside formal education of the child is all too important (see section 9:2), so that what the child learns at school can be sustained and re-enforced by the wider society (see section 9:1:4).

And so, the scope, content as well as interphase of EE with such issues as politics and places such as the home, school and community environments, becomes more complex than simply 'giving' children EE and expecting to have the anticipated behavioural outcomes. Again, the suggestion of starting EE early so that children develop an 'environmentally friendly Habitus' as indicated by participants (see section 8:1:1:2b) and some authors (Batosh, 2003; Bryant and Hungerford,1977; Miller,1975; Rajeski, 1982; Wells and Lekies, 2006), becomes more imperative than ever.

9:3:1:4 Scientific Knowledge Present in Traditional Beliefs and Practices

Contrary to claims by some participants and authors earlier discussed (see sections 3:5, 7:1:2:3a and 9:3:1:1) that traditional knowledge systems concerning the environment is rejected because there is no scientific basis to such claims, some of the TEBP did entail what has come to be known as scientific knowledge and reasoning. For example, King recalled being told that "if one planted an Abor tree one will live long like the tree and will get more air and rainwater to drink" (King:47). This is based on scientific knowledge. Trees produce oxygen ("…more air…") through the process of photosynthesis. Evapotranspiration from trees are a part of the rain cycle ("…rain and water to drink") and both enhance quality of the environment which enhances long life ("…one will live long…"). Jane recounts a similar experience and states that her grandpa did not permit trees around the house to be cut down because they provided shade, fresh air, and protected the land (Jane:42). Again, fishing, farming or entering the forest were and still are (in some communities) forbidden on certain days and participants recalled that, at certain times of the day and on certain days, one was not allowed to fetch water from water bodies. Every ecologist understands the essence of allowing nature to replenish, allowing the land to fallow and water bodies to 'rest' especially during breeding seasons to ensure continuity of life in such habitats. Even if indigenous people did not use such terminologies as taught in

formal education as Bob noted, indigenous people may not have used the name green belt, but they knew for example, preserving the vegetation brought several benefits (see section 7:1:1:1).

Boven and Morohashi (2002) state that knowledge consist of indigenous knowledge systems as well. It is therefore important to acknowledge and engage these knowledge systems or other ways of knowing in providing formal education and or implementing EE programs especially as findings of this research has revealed that, some students and teachers are still inclined to these forms of knowledge systems. This will make the knowledge sector richer with more options or an amalgamation of ideas which work to promote EE. Findings also revealed that indigenous knowledge systems have been disrespectfully ignored. It is important that where indigenous knowledge forms and practices still exist, attempts are made to understand the epistemology of traditional people in such areas in allowing such practices, so that navigating through or around them or even including them in education (both formal and informal), does not occur from misguided principles or grounds. For example, there were reports from participants of locals resting and not fishing on Tuesdays, while government authorities gave permission for non-community members who used trawlers to fish. This discrepancy tells a lot about the apparent lack of consultation and collaboration that should guide government and local councils on the need to be mindful of the cultural ethos of communities while giving such permits. Like an Akan adage goes "Se wo were fi na wosankofa a yenkyi," which translates as: It is not wrong to go back for that which you have forgotten" or It is not wrong if one 'returns' to history to 'fetch' good practices. In a sense, the knowledge of the past must never be forgotten, it should serve as a guide both for the present and the future.

9:3:1:5 Environmental Education from Home, School and Community

In primary schools in Ghana, students are expected to encounter EE in subjects such as Social Studies, Environmental and Scientific Education. At Junior High School, they are taught EE

which is integrated into Science and Social Studies. While at the Senior High School level, EE is taught in Integrated Science and Social Studies which are core subjects. Yet findings revealed participants did not encounter much of EE until at the tertiary level (in some cases). According to participants, trainees had poor background or foundation of EE at the Senior High school level which affected present teaching of EE (see section 7:1:1:1 and 8:1:1:3d). This seem to contradict research findings by Mueller and Bentley (2009) which indicated that Ghanaian teachers are implementing an integrated, more culturally relevant and environmentally responsive curriculum in secondary science courses.

Findings also showed that participants could remember and recount with ease encounters that were 'action related'. For example, although they could not remember exactly what the 'taught lessons' in school were, they could remember planting trees, gardening and cleaning. At home they could remember stories and myths and farming activities with parents. In the community, they remembered stories told of myths surrounding TEBP and exploring the environment with friends, gathering fruits, hunting, communal labour, climbing trees and so on, which some participants described as "having their own adventure with the environment". Through these activities, they recounted having a relationship with the environment and recalled that family and community members served as watchdogs in environmental protection (see section 7:2:1:1a). There are a few implications here for EE. First, EE should be action based and consist of activities that fall within what the child enjoys doing at a certain age, thus, the natural developmental cycle of the child. There must also be a cultural consideration for activities carried out or engaged by children of certain age groups in communities. These may differ from continent to continent, country to country and even community to community and may change as society itself evolves, and all this must be factored into EE. In line with this, teachers' knowledge and skills must also be periodically upgraded to accommodate these

changes. For example, activities participants engaged in growing up such as hunting, fruit picking, storytelling etc. may not have pertained in other countries or communities at the time. Again, such activities even within the same community may not be very relevant now since societies evolve, and so a 'straight jacket' approach to EE will not work in all instances. So, while reference to curricula from other regions or countries who may have had good results with EE may serve as a good template, it would not be advisable to fully 'consume' its contents. Also, a 'window' must be left open for communities to identify local topics that need to be addressed in EE, as well as activities into which EE can be easily integrated even if partially (but logically). This will call for research and collaborative work between educational institutions and communities, but once a template is gotten, it would prove beneficial in connecting children with the environment through natural and culturally accepted activities. Only when this connection is made and a relationship with both the environment and communities established, would it be possible to develop a responsible behaviour towards the environment. Since people are naturally good at remembering stories and respond better to emotion and belief (Anderson 2001; Pooley and O'Connor 2000), an assertion supported by findings of this study (see section 7:2), it would be worthwhile exploring how these can be beneficial to EE as well. The nostalgic feeling and expressions (facial and gestures) made by participants in recounting these experiences are still fresh in my mind and affirms that children should be allowed to explore to discover for themselves. Research has established relationship between childhood experience and adult behaviour including experiences in nature and adult environmental behaviour (Wells and Lekies, 2006) which has been supported by findings from this research (see section 4:2:6). Wells and Lekies (2006, p. 14) reported that, "When children become truly engaged with the natural world at a young age, the experience is likely to stay with them in a powerful way - shaping their subsequent environmental path". Yero (2010)

indicates that, a teacher's behaviour frequently spring, not from higher level thinking processes, but from habit (habitus) and so ingrained in the habitus of every citizen and at the centre of any EE programme must be the goal to develop a Habitus of "…a deep concern for the common good and a sense of responsibility for maintaining harmony with nature…" UNESCO (1990, p. 191). These variables of concern, responsibility and knowledge are also listed among variables which lead to development of environmental citizenship behaviour developed by Hungerford and Volk (1990) (see section 2:2:3). Similarly, Schumacher, (1973, p. 64) described education as the "greatest resource" for achieving a just and ecological society. And so, the question of EE and what it should entail to bring about the development of an environmentally acceptable habitus becomes very important. Bourdieu, (1984) is therefore justified when he writes, that the habitus has the potential to influence our actions and to construct our social world.

9:3:1:6 Providing the Means to Drive Action

Although it may be easy to point at EE (formal and informal) as a vehicle to ensuring environmental protection, findings in this study have revealed that there are more critical and deep-seated issues that must be addressed to go hand -in -hand with EE, in bringing about the change so desired. EE may be a means of educating the citizenry in dealing with such issues as environmental degradation, sanitation and others, but at the heart of this is providing alternatives for the practice of a desirable behaviour. For example, no matter the amount of education a person receives (formal or informal) on the effects of open defecation, that person will still openly defecate if he or she has no toilet. The provision of a toilet therefore becomes a prerequisite which gives such a person an option or empowers them to behave responsibly having acquired knowledge to do so. Also, government cannot for instance pass a law banning cutting of trees which locals use as means of fuel for cooking without providing affordable alternative sources of fuel because, people will only go back to cutting trees to sustain their life.

Again, if people have the knowledge of being responsible with litter, the provision of a litter bin for example, will grant them access to take that alternative. To further illustrate this point, I would share an experience I had during the data collection process of this research. A participant explained that students are told to make use of the litter bins placed at vantage points on campus, but lamented that students instead chose to drop litter around the campus. After the interview and while waiting for my cousin to pick me up, I walked around the campus and noticed I had not come across a bin after 2 or so minutes of walking and so out of curiosity, I decided to check around the campus, and almost another 2 to 5-minute walk around, I still couldn't spot a single litter bin anywhere on campus except near the dining hall area. That probably explained the empty sachets and other few wrappings littered around. If a student had the knowledge about good sanitation, cared for and wished to take an action in the interest of the environment, that student may be handicapped by the absence of a litter bin. To illustrate further, participants suggested that students have a practical feel on alternative waste disposal methods such as recycling and landfills, but the absence of a recycling plant or landfill or their inaccessibility would not make them options to consider or make students act, even if armed with such knowledge and concern for the environment. It also holds true that, EE teachers cannot organise practical sessions or educational visits if they lack the capacity, skill and logistics to do so. It is therefore vital to always provide a comprehensive means for taking alternative action in the interest of the environment and EE.

9:3:1:7 Professional Training and Competence

A teacher must be well versed in subject content and be skilled in pedagogy for effective lesson delivery. Teaching competence involves teachers believing they have the prerequisite knowledge of the subject (s) they teach and the requisite skills to teach effectively and with confidence (Little, 1995; Pillay, Goddard and Wilssl, 2005).

Findings showed some participants reporting of a knowledge gap. Although participants indicated that much of EE was at the tertiary level, others who received similar education at the tertiary level did not have much EE even though they read same general courses. Therefore, EE was not a composite of education received at the tertiary level by those who generally read science or social studies (courses into which EE is integrated at the college level) but depended on one's area of specialisation within those course areas. This explains why participants who all read the same general courses of science and social studies expressed different levels of competence and in some cases no competence at all in teaching EE resulting from inadequate subject knowledge received. That is why for example, Connie and Milli who read Science and Social Studies courses respectively found themselves wanting because within these general courses, they had specialised in Chemistry (Connie: 27) and Economics (Milli: 46-48) respectively as compared to teachers like Jane and Bob who also read Science and Social Studies courses, but specialised in Biology (which contains most of EE topics) and Geography (which now dominates Social Studies topics) and as such were much more comfortable teaching EE (see section 7:1:1:1b). So, what exactly are these teachers certified to teach? Science, Social Studies, Economics or EE? Because, even for those who specialised for instance in Biology, they complained of not being able to teach "special topics" related to EE and called for more training (see section 7:1:1:2). Generally, the responses on professional preparedness to teach EE showed three categories of teachers: those who were trained in general courses into which EE is integrated at the college level and had to teach EE because it fell within their course outline and so called for more training; those who thought they were under-utilised having been professionally trained to teach EE but restricted by the curriculum and as such called for an expansion of the curriculum to enable students benefit from such knowledge; and those who indicated that courses they offered during their professional training was not in line with what

they were expected to tech at the college level and advocated that curriculum planners take a second look at programmes and courses at the University and CoE level to ensure harmonisation.

Some authors (Ham and Sewing, 1988; Pillay, Goddard and Wilssl, 2005) have noted that, when teachers have inadequate knowledge on a subject, they have misgivings about their own competence to teach. The question of possibly having inadequate knowledge gave participants different concepts of EE at the college level. For example, Aha indicated that trainees were having enough EE since they were taught a whole topic on ecosystem which according to him was "a lot" (Aha: 19). Jane was of the view that once trainees learn above the knowledge level they are required to teach at the basic level, it suffices (Jane: 18). While Frank believed the knowledge given was fine, but that trainees only needed to be focused on pedagogies (Frank: 26). Findings also showed that some participants' perception of the environment did not give an indication of having much knowledge of the interrelationship that exist among elements of the environment and how these affect each other. For example, some participants perceived the environment only as their surrounding and natural things without drawing on the relationship that exists among these elements and or how they affect each other (see section8:1:2:1). This gap in participants' knowledge could get worse if they are not periodically exposed to new knowledge or actively engaged in what constitutes EE and how it should be taught. Turner *et al*., (2009) notes that, teachers need to have the requisite knowledge in EE so that students will be able to achieve environmental literacy. According to Spiropoulou *et al*., (2007), such knowledge is needed to avoid a situation where students are misguided in their learning experiences because teachers lack the requisite knowledge to teach them effectively. Hungerford (2009), McDonald and Dominguez (2010), also stress the need for teacher education institutions to address specific teacher competencies for EE and provide adequate

training and preparation for beginning teachers to ensure teaching of quality EE. In this regard, the collaboration of all stakeholders is of essence. Government must have clear policies on EE in the country and this should drive programmes at the universities that produce college EE teachers, as well as inform developers of the curriculum for colleges and pre-tertiary schools. Although teacher commitment is key to overcoming some barriers to EE (Shuman and Ham, 1997; Yero, 2010), it is true to the extent that they are empowered to overcome such barriers. A teacher who lacks content knowledge in a subject cannot succeed in using pedagogical content knowledge to make teaching meaningful to students even if all the resources for teaching is available. When the knowledge factor is missing, finding alternative ways and organising learning experiences to expose students to such knowledge cannot and will not be attained, and so making sure teachers have a solid content knowledge foundation in EE is a question of necessity.

Still on teacher competence, participants noted that there were unqualified teachers such as physical education and business administration teachers who were employed to teach EE. If it is bad enough that the general training offered to teachers mainly trained to teach Science and Social Science makes some of them incompetent to handle some EE topics, then this makes it worse. Worse not only for the teachers who may and will struggle to teach it, but worse for the trainees who will grapple to find their locus in such learning situations. For trainees who have been exposed to such unqualified teachers, their ability to teach countless number of children will be questionable and yet damaging. It is this ripple effect of teacher education and the sensitive position it occupies which makes it imperative that products coming out of there must be adequately prepared by qualified competent teachers to perform such tasks as they will be mandated to.

9:3:1:8 Continuous Professional Development (CPD)

Continuous professional development (CPD) is recognized by all professionals as necessary in ensuring maintenance of good practice (Guskey, 2000; Avalos, 2011). Robottom *et al*., (2000), contends that professional development is a priority in the field of EE and is pertinent in realising the goals of EE. Yet, Fien and Rawling (1996), Hotchkiss (2011), Robottom (1987) and Tewksbury and Harris (1982) have all noted that, in-service training or professional development in EE in teacher education remains at an unsatisfactory level and not organised as frequently as should, an assertion which has been supported by findings of this study. According to de Vries, Jansen and van de Grift (2013), the greater teachers' participation in CPD, the more student oriented those teachers are. Generally, participants understood the need for CPD and indicated they could make time for it should it be organised. The need for CPD in the teaching arena makes me recall a story my mother told me about a woodcutter who did not sharpen his axe frequently and so fell less and less trees each passing day. The moral of this story is not far from the truth of what participants reported, they are expected to perform and yet their skills used in delivering successful education are not sharpened. Participants also did mention administrative failures regarding information on invitations for CPD programmes which demotivates them. The responsibility of CPD according to most of the participants lay with the colleges and the Institute of Education and that is why they saw their own attempt to get CPD as 'odd' (see section 7:1:2:2b). This finding is contrary to a study in Ireland in which teachers indicated they were responsible for their CPD first, before naming other bodies (McMillan, McConnell and O'Sullivan, 2016). Rinaldi (2006) had earlier indicated, that professional development should be a personal endeavour and should spring from within the teacher. Thus, for active professional development of the teacher, the teacher must be actively engaged.

Daly, Pachler and Pelletier (2009) call for a collaborative approach of all stake holders and

Forte and Flores, (2014) make and addition that it should not be driven by a top-down approach. There was mention of T-TEL, a UK AID sponsored program which sought to provide some CPD, but while some participants indicated it helped in the teaching process, others said it only addressed methods of teaching. It may be interesting to find out what need assessments and consultations goes into the development of such programmes. The imperative need of integrating professional development early and often into teacher preparation programs is the effect it has on teacher education. Back to the story my mother told about the wood cutter who did not sharpen his axe and whose action led to him cutting less tress each passing day. If axes are sharpened, it affects the effectiveness with which the wood is cut and sculptured. So, it is with CPD, it sharpens teachers' skills to effectively deliver lessons. Also inherent is the 'silent teaching' it relays to the trainees, which Cuban (1995) refers to as the learned curriculum, which is very instructive in helping trainees carve or model their lessons in future in likewise or better dimensions to benefit their students. Creating opportunities and motivation for teachers to engage in CPD therefore needs critical attention.

9:3:2 Classroom Experiences

This theme discussed participants experiences from the classroom and included their experiences with EE as a subject, the pedagogies employed in their teaching, philosophies, previous experiences with teaching and their interactions with the media.

9:3:2:1 EE is an Add-on Subject

The phenomenon of EE interfacing many subjects and or crossing many disciplines is not new. However, participants reported their challenges to include EE taken as an add-on subject or small aspect of science. Similar findings have been reported by many researchers (Beatty, 2012; Chang, 2014; Clarke and Mcphie, 2014; Disinger and Roth, 1992; Gayford, 1991; Goodson, 2013; Wheeler, 1975). The effect of this integration is shown in the inability of

educators to identify and use those pedagogies that would best fit into teaching topics or aspects of their course that border on EE. This is made worse if teachers lack content and pedagogical content knowledge as some participants reported was the case in this research (see section 9:3:1:7).

9:3:2:2 Pedagogies

Having knowledge doesn't translate to action, neither does it translate to effective teaching. There is always the need for effective pedagogies both in transmission of knowledge to students and transforming such into action. That is the reason why some participants stated that how EE is given is the defining moment of teaching and learning. Thus, the mode of lesson delivery or presentation of EE underpins the education process in this subject area. (see section 7:1:2:1)

Findings revealed that most participants were conversant with a range of pedagogical approaches and alluded to the use of such approaches that were child centred and participatory. Some participants however, stated that, they were restricted by curriculum demands and examination and so often used the lecture method which ensured that the course outline was completed on time to prepare students for examination. Findings revealed two categories of participants. Those who insisted that they made use of participatory pedagogies despite time constraints because they thought trainees must learn by the teacher's example, that is to say 'do as I do' and those who stated they used the lecture method, but encouraged trainees to use the child-centred approach upon completion, in other words, 'do what I say and not what I do' (see section 7:1:2:1a). For those participants who used participatory pedagogy, they recounted the effectiveness of such pedagogies when they themselves were being trained professionally and how they enjoyed such lessons and so it would seem those experiences influenced their decision to use participatory pedagogies despite the demand to complete the course outline on time and other limitations. This further illustrates habitus persistence and influence on perception and

informing action (see section 9:1:2, also see Bourdieu,1976/1984; Bourdieu and Wacquant, 1992). Again, some researchers (Esa, 2010; Kennelly *et al*., 2008; Shuman and Ham, 1997) have noted that life experiences can be retained and reinforced during a teacher's lifetime and influence teacher's commitment to implement EE. In relation to the second category of participants who used the lecture method but expected trainees to use child centred approaches upon completion, an important question to ask is where trainees are expected to learn the use of such approaches from, if it is not on the 'training field'? This can be likened to a situation explained by Yero (2010) on personal practice theories of teachers themselves and part of what Cuban (1995) referred to as the taught curriculum. Yero (2010) gives an example of a professor who spent three hours in a graduate class lecturing on the topic "Why Teachers Shouldn't Lecture Students." She argues from this premise that despite any effective arguments advanced in this lesson, the method chosen by the lecturer spoke volumes. She goes on to make the point that students who are long accustomed to being taught by being lectured may not even recognize that other types of teaching are possible. For preparation of effective teachers, research finding indicate that both the knowledge of the subject being taught and the "knowledge and skill in how to teach that subject" are critical to classroom success (NCATE 2006, p. 4). Participatory pedagogies will help trainees discover knowledge and build skills, as well as give them the ability to model appropriate teaching methods for use in their own classrooms when they complete their training.

Other participants justified the use of the lecture method because trainees were considered higher education beneficiaries who could cope very well with non-participatory pedagogies in comparison to pupils at the Basic school level (see section 7:1:2:1a), but this contradicts the call for use of participatory approaches and opportunities for active involvement at all levels of EE (UNESCO, 1990/1992). A ten-year study by Coyle (2005) in the USA indicated that hands-

on activities, investigational approaches, out-of-the-classroom experiences, and student-directed learning were hallmarks of effective EE programs. Again, this notion of using a lecture method because trainees are not at the basic level gives not only an indication of some of the misconceptions participants have of pedagogies to be used in colleges, but also questions the preparation of teachers who teach in colleges, especially their philosophy of education and how they think knowledge should be given and acquired. While tertiary education students (colleges included) may have the cognitive ability to understand some concepts that are not directly activity related and or involve participatory pedagogy, it must be noted that first of all, these are trainees who are being prepared to teach at the basic level and as such, are learning to teach students whose understanding of concepts is mostly hinged on child centred pedagogies. Thus, they should be taught using child centred pedagogies as much as possible and taught how to use these in teaching. Going by Cuban's explanation of the taught curriculum (see section 2:2:1), trainees would be more likely to use participatory pedagogies when their teachers use it in teaching them. Secondly, trainees themselves need to be involved in such pedagogies because aside their understanding concepts, interaction with materials or participatory learning to discover knowledge is central to meaningful learning.

Some participants advocated that pedagogies for teaching EE should be separated from those of science and social studies and should be of practical orientation and not dominated by the lecture method, to make it interesting (7:1:2b). A seemingly subtle admission that the lecture method was predominantly used in teaching in these two areas and thus, the same was being transferred to teaching EE topics. This gives credence to findings that dominant subjects into which EE is integrated can overshadow EE and thus methods of teaching those dominant subjects and attitudes of teachers towards those subjects inevitably affect EE (Miles, Harrison and Cutter-Mackenzie, 2006; Plevyak, Bendixen-Noe, Henderson, Roth and Wilke, 2001).

Some authors (Aird and Tomera, 1977; Blum, 1982; Bazan, 1976; Davis, Doran and Farr, 1980; Hepburn, 1978; Iozzi, 1989; Jeronen and Raustia, 2009) have indicated the effectiveness of using participatory approaches in teaching EE. These studies have shown that participatory pedagogies are effective methods in developing knowledge, the psychomotor and affective domains of EE. Some researchers (Lord, 2010; Klein and Merritt, 1994) have also indicated that participatory approaches lead to improved student performance in developing critical thinking, interpretation and analytical skills. According to Robottom and Hart (1993), three paradigms: positivists; interpretivists; and critical approach influences teaching methods in EE (see section 4:2:3) and they argue that the interpretive - critical approach to teaching produces better results in EE than the positivist approach. Although child centred pedagogies are recommended in all teaching, teaching EE may include dimensions that are quite different from the mainstream subjects. For example, issues that have to do with values and morals which play into behaviour formation and reform, may not be fully supported by traditional scientific methods. Therefore, a teacher trained to teach science may not easily know of teaching methods which helps in inculcating these aspects of learning in students.

9:3:2:3 Philosophy and Pedagogies in Teaching

Philosophy informs instruction (Biesta, Priestley and Robinson, 2015; Ortman, 1962). Since it borders on what one considers to be ways of giving and acquiring knowledge, it will nonetheless inform how a teacher organises learning experiences. Some authors (Coe, 2014; Elliott, 1998; Greene, 1973) argue that, a teacher's philosophy will no doubt affect how he or she organises and carries out the teaching and learning process and some participants did mention that their philosophies of education influenced how they organised learning for students (see section 7:1:2:1). The choice of a teacher to implement one approach of teaching and not the other will not only depend on his knowledge and skills in using such an approach

and hence pedagogies in teaching but will be influenced by his or her philosophical alignment. If teachers feel students should be told what to do, it will influence their approach to teaching. If on the other hand they think students should be assisted to be liberated in mind to search, discover and find knowledge for themselves, it will also influence their pedagogical approach. Yero (2010) gives a scenario of two teachers; one who frequently disciplines students for making "too much noise", believing "quiet" is a requirement for learning and students in another teacher's class who enthusiastically argued about issues. Irrespective of the answer one might give as to which scenario learning is occurring, the underpinning factor is the philosophical school of thought to which a teacher is aligned and subsequently how he or she believes knowledge should be gotten or how learning experiences should be organised to get such knowledge. For example, despite challenges enumerated which were almost the same for all participants, those who believed in the use of interactive and or child centred approaches to discovering knowledge still used them, although not to the extent they would have wished to due to time limitations (see section 7:1:2:1a), they used such approaches nonetheless. The implication is therefore that, in training teachers for EE, they should be imbued with philosophies that work towards how knowledge and or learning experiences should be organised. For instance, if students are expected to explore and discover knowledge, the constructivist approaches and pedagogies which encourage the active involvement of students in the teaching-learning process and has a positive influence on knowledge acquisition should be encouraged.

9:3:2:4 Previous Experience and Teaching

Life events and experiences (habitus) have been identified by developmental theorists as important aspects of an individual's history which informs behaviour development and career choice (Stewart and Lykes, 1982; Manaster and Perryman, 1974; Mohney and Anderson, 1988;

Skovholt and McCarthy, 1988). Participants indicated various experiences that contributed to their choice of profession and still influenced their teaching of EE (see section 7:1:2:3b). Findings also support research findings that relate the influence of previous experiences of teachers to their current practice (Esa, 2010; Shuman and Ham, 1997). However, Shuman and Ham (1997) suggest that, in addition to personal experience, structured learning experiences can also influence a teacher's teaching of EE. This means that, even when teachers do not have such experiences or habitus which promotes EE teaching, structured learning experiences such as CPDs and further studies can have an influence on their teaching. Findings also showed that teachers thought students did not receive much EE and sought to fill in this gap by teaching students outside the curriculum. This shows teachers' perception and experiences can influence teaching and learning process. Shuman and Ham (1997), discovered that beliefs and values which are shaped by the teacher's experiences in turn influence teachers' attitude, subjective norms and the control they have in teaching EE.

9:3:2:5 Experience with Media and Environmental Education

The media are powerful sources for influencing environmental attitudes and values and should not be ignored in the comprehensive approach to EE. Coyle (2005) in research spanning ten years found that for most adults in America, the media is the only steady source of environmental information. Other forms of media including internet-based visual presentations, television, watching nature films and reading about the environment, public broadcasting messages, can be used to give information on and influence students' environmental attitudes, values and behaviour (Alaimo and Doran, 1980a; Coye, 2005; Eagles and Demare, 1999; Mehne, 1976; Pearson, Dorrian and Litchfield, 2011; Zimmerman, 1972). Yet findings in this research revealed that participants occasionally had little or no encounter with EE from media outlets during their developmental years, although there was an indication of enjoying such

programs on television in adult life. Some did indicate that they refer students to use books and the internet when students need to know more on EE (see section 7:1:2:3b). This finding gives an indication of the need for the media to be partnered in EE for the benefit of all citizens. Teachers may also need to be trained on how the media can be used to effectively enhance EE in and out of the classroom.

9:3:3 Perception of the Environmental Education (EE) Curriculum

The objectives of the Tbilisi Declaration which had considerations from both the Stockholm Declaration and the Belgrade Charter indicates that, EE goes beyond cognitive knowledge about the environment and encompasses education whereby learners develop responsible environmental behaviours. The objectives include, developing environmental awareness, knowledge, attitudes, skill and participation (Hungerford et al., 1980; UNESCO-UNEP 1976). Participants gave their views on the curriculum, from content through to what needed to be addressed, to proposals for curriculum restructure and what such a restructure should entail.

9:3:3:1 Content of Environmental Education

While there is no literature to support specific topics that should be taught in EE, as listed by the participants (see section 8:1:1:2a), there is an indication of what content EE should encompass such as, environmental knowledge and the development of skills and affective domain which will allow students to feel part of, have love for, identify and appreciate environmental issues and be able to solve environmental problems (IUCN,1971; Palmer, 2002; Stapp *et al*., 1969; UNESCO,1997). The finding showed that participants were aware of the development of all these domains in addition to the knowledge trainees needed for comprehensive EE. The call by some participants for the curriculum to include current local, national and global emerging environmental issues, as well as hand-on activities in EE (see section 8:1:1:2a) gives an indication of some participants' appreciation of the scope of EE and

its content as well as the effectiveness of such participatory pedagogies. Participants were however of the view that EE is not adequately addressed and that enough was not being done to bring about behaviour change which is central to EE. Participants also indicated that students are given the requisite content knowledge to pass examination (see section 8:1:1:1) which seems to support findings which indicated the overreliance of institutions on the knowledge aspect of EE to the detriment of developing the psychomotor and affective domains (Chi Kin Lee and Williams 2001). Yet it has been found that the acquisition of knowledge alone does not automatically lead to attitudinal and behaviour change (Hungerford and Volk, 1990). Rather, Hungerford, (1996) noted that students will need to take ownership of, feel part of issues as well as feel competent and empowered to act on those issues. Again, the goal statement from the Belgrade Charter (UNESCO-UNEP, 1976) advocates that EE should transcend the cognitive aspect of environmental knowledge and draw attention to the psychomotor and affective domains which help learners develop responsible behaviour towards the environment. The superficial nature of EE identified by participants has also been recognised in studies elsewhere among pre-service teachers in the USA (Moseleya, Desjean-Perrotta and Utley, 2010), Tanzania (Kimaryo, 2011) and Nigeria (Ogunyemi and Ifegbesan, 2011). Some participants indicated that an earlier review of the social studies curriculum rather took out topics and aspects of EE directed towards teaching for action and other practical aspects and so for example, trainees could define concepts but could not identify or apply these in real life. One such example was given in which students could define types of erosion but could not identify same when taken to sites where erosion had occurred. Some however indicated that the few times they had been able to engage students in participatory and action-oriented learning experiences, they noticed that trainees had been positively affected by the behaviour they exhibit towards the environment within and outside the school premises. (see section 8:1:1:1).

9:3:3:2 Preparation of Trainees – To Teach or to Pass Exams?

Participants indicated that trainees were not adequately prepared to teach EE upon completion and similar findings have also been made by other researchers. In Tanzania, Kimaryo (2011) found that, teachers were not well-trained in the teaching of EE in schools. Similarly, Wilke, Peyton, and Hungerford (1987, p.1) reported that, "few, if any, teacher training programmes adequately prepare teachers to effectively achieve the goals of EE in their classrooms". Some researchers (Ernst, 2007; McKeown-Ice, 2000; Miles and Harrison, 2006) have noted that, prevalent barriers to effective implementation of EE in elementary schools include lack of preparation during pre-service programs. Similar research (Schwaab,1976; Peyton and Hungerford,1980) concluded that, preservice teachers are not adequately prepared to help develop environmentally literate students.

The findings of this study revealed a trend of teachers preparing trainees to pass examinations. Participants indicated that preparing students to write and pass exams informed what content was taught, how it was taught and how it was assessed. Since the external exams which ensured trainees certification was mainly on assessing the knowledge component of the course, teachers restructured their teaching and internal assessment in like manner. Participants also mentioned that both teachers and students did not pay attention to topics and practical aspects which were not examined (see section 8:1:1:1c). The question therefore is whether trainees are being prepared to develop environmentally friendly behaviour for action and to effectively teach and pass on the same or whether they are being prepared to pass exams? The quest to acquire institutional capital in the form of certification in this instance, has blinded the need to have and implement a curriculum which develops other domains of learning, needed for empowerment which brings about action and change. Although knowledge is required for the development of psychomotor and affective domains of learning, over reliance on cognitive

outcomes can hinder the development of the affective and subsequently behavioural domains (Hungerford and Volk, 1990). This is not good training for trainees who are expected to carry on the mantle of educating others, especially in an area like EE which is meant to bring about behaviour change and empowerment for action to solve environmental problems. Some participants did recount that EE has not always been informed by what would be examined. They stated that in times past and before the curriculum was restructured, educational visits and outdoor engagement of students was part of the curriculum and indeed was examined as students were asked questions that demanded that they would have experienced such learning, carried out such projects and or acquired such skills to be able to pass. But according to some participants, the restructure mostly took out those aspects which developed the affective and psychomotor domains of trainees (see section 8:1:1:2). How a curriculum would be reviewed to take out the very things it is meant to teach and promote and by who, are very important questions that begs not only to be answered, but also questions the capacity of those who supervise such restructuring of curricula and how well informed they are of the objectives of such subjects, courses or programs. Peim and Flint (2009) believe the current educational system is structured by and for assessment. They contend that "a foundational relation with assessment organises contemporary education" (p. 343). This is supported by findings of this research which revealed that examination and certification (assessment) has become the 'soul' of teacher education and there is the need for a rethink of the type of curriculum that should inform teacher training.

9:3:3:3 Restructure the Environmental Education Curriculum

The call by participants for a curriculum restructure that is more practical in its approach, responsive to the society and geared towards solving current and emerging environmental challenges was informed by participants' perception that trainees were not being adequately

prepared to teach EE upon completion (see section 8:1:1:2b). These objectives of an EE curriculum pointed out by participants have earlier been emphasised by some authors (Hungerford *et al*., 1980; Stapp, *et al*., 1969; UNESCO, 1997) as the fulcrum for EE. Although some participants indicated there was a curriculum restructure due in 2017 which participants hoped would broaden the scope of EE (see section 8:1:1:2b), at the time of writing this report in February 2018 such a restructure had not yet taken place.

According to Wheeler (1975), Goodson (2013) and Gayford (1991), EE has been problematic since its inception. Also, Disinger and Roth (1992) indicate that the interdisciplinary nature of environmental literacy complicates it for educators. In addition to these, findings of this study revealed that the complex and confusing nature of EE also resulted from different names and contents assigned to EE at each level (basic, secondary and tertiary) which formed part of reasons participants called for a curriculum restructure. Participants noted that much of EE was started much later in the educational ladder of students and mostly if they studied related courses. They therefore advocated for it to start much earlier so children grow with environmental literacy and consciousness as well as skill and empowerment to solve and or deal with environmental problems (see section 8:1:1:2b). This advocacy of making children encounter EE early has also been shared by Bartosh (2003), Rajeski (1982), Bryant and Hungerford (1977), Miller (1975) and Stapp, *et al*. (1969). These researchers also contend that development of effective concepts concerning environmental issues and an understanding of how to play an effective role in solving environmental problems can begin at elementary levels.

Participants stated that the curriculum needed to be restructured to incorporate more topics as well as address all the domains of learning (cognitive, affective and psychomotor). It was also apparent that participants had different ideas as to what topics should be included but generally the topics covered local, national and global as well as new and emerging

environmental issues (see section 8:1:1:2b). Since participants indicated that EE should cover all learning domains, it would be worthwhile to consider the Behaviour Models discussed in section 2:2:3 in developing a curriculum that develops environmental consciousness and good environmental behaviour. These models have the three domains of learning (cognitive, psychomotor and affective) being central to their effectiveness. Also, in developing the EE curriculum, it is appropriate to consider indications made by Palmer, (1998) who states that for development of EE, it is necessary to use a dynamic model that considers individual peculiarities and personal experiences of students. This consideration is of immense importance because, aside considering the personal experiences that forms the individual's habitus which affects behaviour, the individual and society are constantly evolving and developing and the window for changes that comes with these environmental evolutions must be made and or provided for in the curriculum and so ensuring dynamism in any model for EE is apt. As Wals (2015) explains, the world is constantly and rapidly changing and what we think is sustainable today might not be sustainable tomorrow. In the same light, what is considered as an environmental issue today, may not apply tomorrow. Again, the consideration of the individual's personal experiences (habitus) is of huge significance because it gives the individual a point (s) of relation and a personal connection, concern and commitment to the environment. From participants reports, such a curriculum must also have consistency both in name and related content throughout all levels of education, instead of having different names and mostly unrelated content across the three tiers of Ghana's education system.

9:3:3:4 Involve Teachers in Curriculum Development

If there was any part of the research findings that participants agreed mostly on, it was this one. Participants stated that they were not involved in curriculum development, although one or two specified they had been invited at one time to participate in such a process and mentioned

that invitation was down to who was willing to involve you. They further indicated that during such rare occasions when they were invited, they could not be 'trusted' to fully engage in the curriculum development and restructuring process and so on such rare occasions, what they were expected to do was already lined up for them and they had to work within those parameters. But one participant recounted they had used such an opportunity at one time to 'tune' the curriculum to be in-sync with what trainees would be required to teach or encounter at the basic level (see section 8:1:1:2c), attesting to submissions earlier made that there are disparities between what is taught in colleges and what trainees are expected to teach upon completion. This disparity has been noted by Quashigah, *et al*., (2014) in their evaluation of the social studies curriculum used in colleges of education in Ghana vis-à-vis the junior secondary school syllabus.

Overall, participants felt they had been left out of the whole curriculum development process although they were the frontline implementers of the curriculum. They did note that if teachers are not involved in the process, they won't be committed to what is 'given' to them to teach, which is arguably understandable because, they do not 'connect' with or identify with it and most importantly, do not feel a part of it. Research has shown that when teachers do not have a connection with the curriculum it poses problems of implementation (Yero, 2010). Calling for involvement to at least edit what is done sounds like a mark of desperation and yet a commitment by participants to be involved in a process they so much feel a part of, have wealth of experience about, and yet feel left out. Statements like "they sit up there …they bring it and dump it on us to teach" (Connie: 36-39), "we are those on the ground… are you doing it for yourselves? If is for the trainees, we teach why not involve us?" (Frank:41) and so on, smacks off a strain in relationship that exist between these participants and the curriculum developers and indicates the existence of a power play in which the teacher feels there is a superior power

that determines what must be done. So, they are recognised on one hand as being part of what must be done so that the curriculum is transmitted to students and yet on the other hand, they are restrained from 'touching' the curriculum which they must implement. These findings align to those of Cronin - Jones (1991) who opines that, despite the recognition that teachers can, and do influence the success or failure of reform efforts, they are largely ignored in designing such. Findings from this aspect of the study are also expressed in the thoughts of Yero (2010) who states that;

> "It is clear that curriculum developers recognize a teacher's influence on even the most scrupulously designed and detailed curriculum. They have even attempted to design "teacher proof" curricula to prevent teachers from contaminating the purity of the design. In the current reform, teachers are expected to play a key role in the reform effort, but their views of teaching and learning are thought to be a major impediment in that effort." (Yero, 2010, p2)

Participants indicated that the curriculum was deficient. Some were of the view that students needed to know more and followed students' passion of seeking for more knowledge. Others thought they needed to "beef up" students' knowledge, whilst others thought much EE was simply not given to students (see section 8:1). Once participants were convinced of this deficiency of the curriculum, they sought to make up for the deficiency on their own terms, a situation which probably could have be avoided had participants been involved in the development stage. For example, Milli saw anti-environmental behaviour in the city and realised there was the need for people not to drop litter. She became concerned that people were not educated enough on the environment and so in her class she taught students on this aspect of EE. It did not matter whether the curriculum made provision for it or not, she found space and time to teach it. Connie felt students needed more knowledge on EE which was not provided in the curriculum and simply 'topped up' students' knowledge. When Bob, Milli and Ray felt that chunks of EE had been taken out of the curriculum during a curriculum restructure process (which they were not part of and which they thought should not have happened), they simply

found a way of teaching those topics they thought were relevant but were taken out of the curriculum (see section 7:1:2:1(b) and 8:1:1:3b). It is worth noting that these same teachers who complained of inadequate time, made time to teach what they thought was important for students to know. This is what Cuban (1995) refers to as the Taught curriculum, which is what teachers choose to teach and which is informed by their knowledge of the subject, their affection or dislike for topics, their experiences in teaching the content, and their attitudes toward the students they face daily. As opposed to the official curriculum which is brought for them to teach. The implication is therefore to involve teachers in the process of organising what students should be taught and by implication (although not always the case) what students should learn, even if it means having to sometimes convince them with reason to agree to alternative views that should inform the curriculum.

The complexity of teachers and what influences their teaching may not be fully understood at this point as with the issue of human behaviour itself, but it can start by involving teachers in processes they are a part of such as curriculum development. The issues may not therefore be so much of time as it is with teachers' commitment to teach what they think and believe students should be educated on and as such 'fighting' a curriculum they think has been imposed on them and by implication, on the students. The call for teachers to be involved in structuring what students should learn and how they should learn is key to EE and must be comprehensively addressed, otherwise as teachers themselves stated, any curriculum developed without their input is not likely to succeed. In other words, teachers must accept the curriculum and the curriculum must 'carry' what teachers think students must learn. It must have their say so and or endorsement or 'blessing'. If any changes in EE or the curriculum is to be made which happens to be contrary to what teachers think, then the teacher's 'say so' or thoughts on such must be the point of influence and must be made in such a manner as to provoke their

consciousness to a level that they understand the change and give their consent. When their thought and beliefs are brought to the point that they are in line with what EE should be, involving them in the preparation of such a curriculum will promote rather than thwart efforts made for effective EE.

9:3:3:5 Barriers to Environmental Education

Some researchers (Kim and Fortner, 2006; Simmons, 1998; Samuel, 1993; Stone, 1989) have identified challenges to EE such as lack of adequate resources, lack of skills in taking children into outdoor settings, lack of perceived preparation time, overcrowded curriculum and lack of personal commitment to EE. The above challenges and others such as logistics and time constraints, teaching restricted to classroom, institutional bottlenecks affecting teachers' professional development and lesson organisation, students' attitudes to EE, inadequacy of course to address societal needs, poor teacher background in EE discipline, teacher qualifications and competence identified in this study have been reported in other studies. For example, several researchers (Evans, Whitehouse and Gooch, 2012; Mills and Tomas 2013; Tan and Pedretti, 2010) reported overcrowded curriculum, transportations challenges, insufficient teacher knowledge and a lack of training opportunities in sustainability education as barriers affecting EE. Other researchers (Childress, 1978; Ham and Sewing, 1988; McCaw, 1980; Pettus and Teats, 1983; Stevenson, 2007; Tewksbury and Harris, 1982; Trojcak and Harvey, 1976) have also identified logistical, conceptual, educational and attitudinal barriers, time, lack of funding, class size, attitude of the principal, availability of outside study areas, conflicting goals of EE and traditional schooling and teacher's poor background in discipline as barriers to EE. Researchers (Babiuk and Falkenberg 2010; McKeown and Hopkins, 2002; Cutter and Smith, 2001; Cutter-Mackenzie and Smith, R. 2001; UNESCO, 1997) have found that inadequate incorporation of EE in teacher education is one of the obstacles to successful

implementation of EE, a finding which was also made in this research (see section 8:1)

Although participants' use of improvised materials and their own resources to provide TLMs (Teacher-Learner Materials) as found in this research is commendable (see section 8:1:1:3b), it begs the question of organisation and commitment by both the school and teachers. For example, the TLMs mentioned by participants as lacking are not such that the school cannot afford them or seek for alternative funding or assistance in getting them. Even the teachers could laisse with other colleges, government departments, other non-governmental agencies and or appeal to students themselves in acquiring some of these TLMs. The practice of teaching incorporates other skills such as these and teachers must be assisted to develop these skills as part of their training and or through CPD. Again, teachers must be aware of what goes into organisation of such activities as field trips and educational visits. For example, if King knew from the inception that in organising a field trip which includes female students, one must necessarily make sure a female staff member accompanies such a trip, he would perhaps not have left it till the last minute to find a female teacher who was available to execute such a function (King:30 and field notes). Yet again, instances such as these shows inefficiency of school administrators who could and should have done due diligence to ensure all was set and or request that all requirements be met before the actual trip date. It also shows what seem to be a lack of support from the administration in such endeavours. As Aha noted, the thought of what one must pass through to secure permission for these trips puts one off (Aha: 30). There should therefore be co-operation between teachers and the school administration to ensure the success of EE. This study also revealed that, teachers of other subject specialisations such as physical education (PE) were recruited to teach EE in CoE and this can hinder EE as they are not qualified to teach in such capacity.

9:3:4 Perception of the Environment and Approach to Environmental Education

Findings showed that participants perceived the environment in four ways; as their surrounding; as resource; a relationship and personal. They also had perceptions of the approach that should be used to teach EE.

9:3:4:1 Perception of the Environment

Participants differed in the way they perceived the environment. To some it was just their surrounding and nothing more. Others went beyond this and saw themselves having a relationship with the environment, although this relationship was in varying degrees with different participants. Others personalised their relationship with the environment while others saw it as a resource to be used for the comfort of man (see section 8:1:2:1). The views of some participants which delineates humans from the ecological or environmental equation have been made elsewhere. For example, Loubser (1992) indicated that humans do not consider themselves to be part of the environment but see themselves as superior to and in control of the other constituents of the earth. In a research by Kimaryo (2011), it was reported that none of the teachers initially mentioned humans as part of the environment. In another research by Moseley *et al*., (2010) which explored pre-service teachers' mental models of the environment, results indicated that most of them did not include humans as a factor in the environment, much less advance further to incorporate human relationships with other factors.

Humans cannot be set aside from the environment and this is also supported by findings in this research where some participants indicated a kind of relationship between humans and the environment including other elements in the environment which affect and are in turn affected by each other. This realisation is critical in understanding the complexities of the environment and that human actions can and does influence other factors of the environment either positively or negatively and that humans are affected by other environmental factors as well. Presently, in

EE discourses involving all environmental issues, there is the question of interaction of humans with the environment together with all the dynamics it entails, and most parts of these debates centre on the argument that humans do not have a co-operative relationship with nature (Steffen,*et al*., 2011).

The relationship between the power of knowledge influencing development of passion for the environment has been made in Some studies (Roth, 1992; Ramsey and Hungerford, 1989; Holt, 1988; Klingler, 1980). For participants who personalised the environment, their passion evolved from knowing how important the environment is to the survival of humanity and the complex relationship that exists thereof, and this gave them a certain orientation of passion towards the environment. According to Opotow and Clayton (2003), how individuals orient themselves to the natural world, can explain how issues concerning the environment become immediate and personal for such individuals. It is also important to note that among the major ownership variables of the behaviour model by Hungerford and Volk (1990) are in–depth environmental knowledge and personal investment variables that make environmental issues very personal, and which is referred to as environmental identity (Opotow and Clayton, 2003) and is critical for the development of responsible environmental attitudes and behaviour (Holt, 1988; Klingler, 1980; Ramsey and Hungerford, 1989; Ramsey *et al.,* 1981; Simpson, 1989). This 'personal' variable is so important that it drove the knowledge of a participant like Milli into action. It broke the barrier of 'who' this participant was, transcended the boundaries of the participant having knowledge of seeming transformation "into a different person" (P6:9) and drew this participants attention to an environmental need which empowered her to act (in this case calling people to pick litter they had dropped). Such ownership and empowerment variables powered by knowledge and a 'feeling for' the environment or environmental sensitivity (entry variable) and the requisite skill to act, are the elements needed for a revolution

in EE which will see humanity take proper care of the environment.

The idea that the environment is there to be exploited and used by humans is not new. Indeed, humans will not survive if they did not make use of natural resources. The call is therefore for the sustainable use of these resources so that future generations are not endangered. This call is not just as old as the 18th century when Jean-Jacques Rousseau emphasised on the importance of an education that focuses on the environment, but also as recent as calls being made currently on local, national and international platforms for sustainable development. There have been calls including those of philosopher Martin Heidegger (1954) who cautioned, that if humans continue to extract from the environment viewing it as a reserve to be used, it will lead to the loss of humanity. Researchers (Dietz, Fitzgerald, and Shwom, 2005; Kimaryo, 2011) found that humans prioritise their needs and see the environment to be of utilitarian value. This perception of humans being in control of and using environmental resources, sets humans aside from the environment and sees every other resource as 'usable' or as a reservoir waiting to be used. This is what has resulted in the destruction of the environment with careless abandon and from which we must now sustainably retreat. Humanity seem to be reaching a point where we must act or die and there is no call as important as that given to those who must educate others on this.

9:3:4:2 Environmental Education- What Approach should be Adopted?

Participants also indicated that EE as a separate subject would afford EE time and space as well as expansion of the curriculum since it is broad and there's a lot to learn on the environment that the current integration model is not fully addressing (also see Jackson, 1992). To some participants, trainees were not well prepared to teach EE because, EE is fragmented mainly into social studies and science and does not address current environmental challenges in its current form. Some participants opined that trainees see EE as a small aspect of science due to how it is taught and that if EE was a separate subject, methods and pedagogy of EE would then be

taught because, as noted earlier pedagogies used to teach EE are pedagogies used in teaching the main courses into which it is integrated (see sections 7:1:2:1 and 9:3:2:1). There was also the issue of 'teaching to the curriculum', and so some participants indicated that if EE is not separated to explicitly teach what it is intended to teach, there's the possibility of it being side-lined or 'swallowed' by the main course (s) into which it is integrated (see section 8:1:2:3). This supports findings made by Gruenewald (2004) who argued that although very imperative, efforts to integrate EE activities into schools are dwarfed by the power of the dominant educational discourse. But in this case and according to participants, efforts are dwarfed by main courses in which EE has been integrated. Some participants stated that at present, EE covers only a quarter of the course outline for social studies and equal or less in science and so they suggested it should be separated. Some participants were of the view that, aside from being a separate subject, every subject should provide an opportunity to include EE whenever possible. For example, some participants suggested that a passage in a subject like English Language could be used to educate students on the environment (see section 8:1:2:3). Although Flaws and Meredith (2007) opined that, integration into other subjects can be used as a strategy to cope with an overcrowded timetable, McDonald and Dominguez (2010) indicate that most institutions of higher education are not designed to work across departments and or subjects areas and so this may present challenges in co-ordinating such teaching and learning efforts. Not only should EE be separated to allow space and time for it to be taught properly, but also of concern to some participants was a deficiency in coverage (see section 8:1:1:1), a situation they hoped would be improved if EE is made a stand-alone subject. Sobel (1996) states that, it is not uncommon to find isolated superficial activities on environmental learning and little attention given to environmental experiences of both teachers and students and according to Gruenewald (2004), the general nature of how EE is defined makes it possible for any practice

that can be loosely connected with EE goals to be called EE, even if a little aspect of the curriculum is devoted to environmental learning.

UNESCO has insisted over the years that EE should adopt a critical approach (see section 4:2:3). Some participants argued that it was better for the EE curriculum to remain integrated. Arguments have been made about EE fitting into an already overcrowded curriculum for both teachers and students (Gough, 2011; Dyment and Hill, 2015) and this was supported by findings in this study where participants were of the view that integration was a better option, as making EE a standalone subject will mean more work for teachers and an additional subject for students (see section 8:1:2:3). Some authors have alluded to the advantages of cross-curricular teaching and learning (Barnes, 2015; Hayes, 2010; Beane, 1997). Such authors opine that, this approach is a creative method or approach which stimulates and motivates learning. But although this may well be the case, the dynamics of cross-curricular teaching or integration are not so simple. Aside what has been stated by McDonald and Dominguez (2010) above(p.198). Spooner and Simpson (1979) observed that when teachers have neutral or negative attitudes toward science, they tend to teach little or no science. It therefore follows that, for a subject like EE which is integrated into science and Social Studies as is the case in Ghana, it is likely to suffer same fate, and the indication will then be that little teaching of EE will occur. Again, research has indicated that the infusion of EE into science and science methods courses, lessens its significance and makes it less likely to be integrated by new teachers. But that is not all, integration of subjects can lead to increasing workload of teachers as they incorporate new dimensions into what they already teach (Miles and Harrison, 2006; Plevyak, Bendixen-Noe, Henderson, Roth and Wilke, 2001). Therefore, participants opting for this approach to avoid increased workload may be disappointed. According to Mills and Tomas (2013), if teachers are not familiar with what is to be incorporated, they may think of it as not being relevant to the major curriculum subjects they

teach or may even be challenged as to how to effectively integrate EE into their teaching. For a subject like EE which is continuously evolving, and an environment of teaching where little or no CPD is given as reported by participants, this may be troubling.

For some participants, what was important, was for trainees to develop environmentally friendly and action-oriented behaviour, as well as gain knowledge and skill to effectively teach EE upon completion. To these participants, it did not matter if the approach adopted to achieve this was integrated or not. They indicated that these approaches were means to an end and as to whether the end was achieved or not was of paramount concern than what went between.

9:3:4:2 An interesting Note

Of interest throughout this research was the use of the phrase 'the environment'. This was not just in the case of the participants; I have used it severally throughout this research as well and have encountered numerous authors and researchers who have done the same. Orr states that "By what we include or fail to include, students are taught that they are part of or apart from the environment or natural world" (2004 p. 12). I just wondered if the use of the phrase 'our environment' instead of 'the environment' will make us more conscious of the fact that we are intimately linked to the environment and we, as part of elements that live in it, must ensure its sustenance. If a person says for instance "our environment is under threat" I wonder if it will raise a conscious awareness and at the same time one of responsibility towards taking an action to help avert that threat, as compared to saying 'the environment is under threat' which seems to suggest a kind of detachment. Because when we feel a part of something, our attitude towards it is surely affected.

CHAPTER TEN

CONCLUSION

Overview

This chapter presents a summary of the study, key findings, contributions of the study to knowledge, recommendations for practice, limitations of the study and concluding thoughts.

10:1 Summary of Research

The focus of this research was to explore the experiences and perceptions of environmental education (EE) teachers in Ghanaian colleges of education (CoE), in relation to their practice of teaching EE in CoE. It included: experiences they had with the environment growing up and how that influenced and still influences their teaching; and their classroom experiences with regards to teaching EE. The study also explored their perceptions of the environment and the EE curriculum. Qualitative methods employing a phenomenological research design were used. Semi-structured interviews were conducted involving ten participants who were selected using a kind of purposive sampling method. The interviews were later transcribed and explicated to allow meanings of participants account to emerge. These meanings were then clustered into subthemes, themes and main themes and reported with direct quotes from participants interview transcripts. The theoretical framework which guided this study was Bourdieu's social practice theory. The findings were discussed in two stages, first, findings were mapped to the theoretical framework and then to extant literature while drawing implications therein.

10:2 Summary of Key Findings

This study was guided by two research questions which sought to explore the experiences and perceptions of teachers of environmental education in colleges of education in Ghana. Thus, the key findings are reported in terms of these lived experiences and perceptions.

10:2:1 Lived Experiences of Participants

This study found out that early education received on environment education (EE) were from home, school and the community and not only did these experiences mould participants' perception and even in some cases inform their professional career but influenced and continue to influence their practice of teaching.

Contrary to some literature and some participant's accounts that traditional environmental practices and belief (TEPB) are fading and education on the environment should not be based on such premises, some teachers still believe in these practices, refer to and engage such beliefs in their teaching and indicated that some students still hold similar beliefs too.

Again, contrary to literature and recounts from some participants which seek to indicate that traditional beliefs lack scientific explanations, findings from this research showed that TEBP were predicated on what has come to be known as scientific knowledge.

10:2:2 Professional Training and Competence

The study found that teacher's philosophy which they developed during their professional training, influenced their teaching and choice of pedagogy and was a great motivation to how they organised teaching irrespective of curriculum stipulations and limitations.

Findings also showed that there were inconsistencies in content of general courses (into which EE is integrated) offered by universities which train teachers for colleges of education and this resulted in some participants facing challenges in teaching EE topics.

Again, there was an indication of little or no CPD for tutors of colleges. Participants presented the organisation of such programmes as the responsibility of the college, Institute of Education and other stake holders and not primarily the 'teachers' business', and so viewed occasions where they used their own resources for such programmes as 'going out of their way to do it'.

10:2:3 Environmental Education Curriculum in Colleges of Education is Deficient

Participants thought that the curriculum was deficient in making trainees competent to teach EE upon completion. Although they indicated that it still contained some aspects that could instil environmental consciousness in trainees, they thought the curriculum was generally knowledge laden, activity deficient and examination oriented, which prepared trainees for examination and not for teaching.

The study also revealed that a recent curriculum restructure in social studies, scrapped many aspects that sought to expand environmental knowledge and promote the development of environmental values, attitudes, skills and behaviour which prepares trainees for action.

There were concerns about different names being given to EE, as well as diverging content at various stages of education which according to participants made it confusing.

Findings also revealed mixed stands on the approach EE should take, but the majority of participants were of the view that being a separate course will offer time and space for EE to be comprehensively and progressively covered but indicated that its integration into other subjects should be done concurrently.

Participants called for a curriculum restructure from basic to tertiary level, it should be given the same name and should contain consistent content which will ensure that EE is comprehensively covered and achieve the goals it is supposed to.

10:2:4 Teachers will Teach What They Think Needs to be Taught

Findings revealed that, within the confines of time and resources, participants taught outside the curriculum and on such topics as they deemed were necessary for students to be educated on. This act was informed primarily by their non-involvement in curriculum development processes. For example, when participants perceived that what was taken out of the curriculum during the last curriculum restructure was still relevant for students, they simply taught those

topics as well as topics they felt should have been included in the curriculum but were not. Again, experiences participants had of the environment growing up and through their education and training according to them made them feel responsible for educating trainees on such EE topics as they deemed necessary.

10:2:5 Teachers' Perception of the Environment

Participants had different conceptualisations of the environment. While some perceived themselves as inseparably linked to the environment and as such affect and are affected by the environment in terms of their actions and inactions, others simply saw the environment as their surroundings, while to some, it was a resource waiting to be used for human comfort.

10:2:6 Barriers to Environmental Education

Aside from the inadequate preparation of teachers to teach EE at college level which participants identified, the following were also identified as barriers affecting teaching EE in colleges of education in Ghana: time and logistics constraints; administrative bottlenecks and uncooperativeness; poor background of students in EE; and a situation where teachers of other subject disciplines are employed to teach EE related topics.

10:3 Contributions to Knowledge

First, this research has demonstrated the application of Bourdieu's social practice theory within educational institutions and related to the social practice of teaching and specifically to environmental education. The study did not only point to the conservative nature of participants' habitus which persisted and, in many cases, influenced their practice, but also indicated the characteristic of habitus which subjects it to change and thus, gives a window of hope for re-education of the habitus, as well as early education to influence the habitus. It also showed how interrelated the concepts of capital, field, habitus and practice are and how the influence of one ultimately affects the other.

Secondly, and as was indicated in the opening chapter of this research, there is very little research done involving environmental educators and environmental education in Ghana. In colleges of education in Ghana, this study is probably the first to be carried out involving teacher educators using a methodology of this nature to explore their experiences and perceptions. Therefore, the literature from the explication of their personal experiences of where and how they acquired EE, the relevance or otherwise of their professional training, their classroom experiences and challenges, as well as their perception of the environment, the EE curriculum and EE in general, are important contributions to knowledge with regards to EE in colleges of education in Ghana.

The method used for participant selection gave fair representation and yet maintained the sanctity of the phenomenological approach which usually is not concerned with representation and generalisations. This method may be useful or at least give ideas for research that may seek to use phenomenology and yet be interested in ensuring some amount of generalisability or representation of ideas.

Again, from the perspective of those who implement the curriculum- teacher participants, their verdict of the EE curriculum and associated reasons for such verdict has been stated. From their involvement in its development, what it contains and what they feel it should contain. Their own competence or otherwise to teach or implement the curriculum and their preferred pedagogical methods in implementing the curriculum, as well as reasons for such choices have also been stated. This is important to structuring the kind of professional training EE teachers in general and especially in colleges of education should have. Participants' position on the approach to EE has also been explored and all these can inform future EE programmes from curriculum design, through training EE teachers to organisation of CPD.

Findings from this study also highlighted the inadequacy of professional training of EE

teachers and CPD. Training and CPD programs will need to take cognisance of teacher's previous experiences which has influenced their habitus, as well as the capital acquired by teachers and its relevance to their current function in the fields (competently teaching EE). These should inform how courses for college of education tutors are structured at the universities, as well as CPD programmes. This can then lead to a gentle awakening of their conscience and slowly educate, re-educate or re-enforce the habitus develop an environmentally conscious and competent teacher.

Finally, teachers will teach what they think ought to be taught, irrespective of curriculum restrictions and hence not involving them in curriculum development only makes them find ways of still teaching what they believe must be taught. This should inform curriculum developers to engage teachers and or at least have their approval of what should be taught in their area of expertise before bringing it out for them to implement. If teachers are imbued with such capital and habitus as is required for EE through their training and CPD programmes, this, together with the experience they acquire in and outside the classroom, will only make their contributions to the EE curriculum richer not poorer. They should therefore be seen and engaged as active partners, without whom the curriculum will be deficient, and not as people who will contaminate the curriculum and from whom the curriculum must be protected. If they can be trusted to implement it, they must be trusted to help develop it. No matter how much expertise a subject expert who helps develop a curriculum has, the teacher has something he or she may lack experience. The teacher has experience from implementing the curriculum, both in terms of content, pedagogies employed and outcomes, even those outcomes that may not be examined and certificated but are nonetheless important.

10:4 Recommendations

Based on the findings of the study, the ensuing recommendations are made to improve EE.

This section covers three areas: recommendations for the EE curriculum for teacher training; training environmental educators; and finally, general recommendations for EE.

10:4:1 Recommendations for Environmental Education Curriculum

Early acquisition of EE was sustained throughout the developmental years of some participants to date. It is recommended that EE should start at the basic level, even from kindergarten so that environmental consciousness and skills to act is developed early (development of an environmentally friendly habitus), sustained through life and should be robust enough to correct any environmental misconceptions the child acquires along the way.

The development of the EE curriculum must as a matter of necessity include teachers. They are the heart of its implementation. As the findings of this study revealed, teacher's experience and perceptions influence their teaching and if they perceive themselves as not being part of the curriculum and or don't approve of what it contains, they will find ways of teaching what they think must be included as findings of this study have also shown. A sure way of winning their trust for the curriculum is to include them and debate their views if they are contrary to what the goals of the programme are. That way, they will through the process of 'agreeing to disagree' or 'disagreeing to agree' find their experience and perceptions accepted, moulded or rejected with reason and appreciate the goals and objectives of such a programme, identify with them and work towards promoting them. Some researchers (Handler, 2010; Fullan, 1991) indicate that the level of teacher involvement in curriculum development is an indicator of how effectively educational reforms will be achieved. According to Alsubaie (2016), for teachers to accept and work with a curriculum, they must be involved in its development.

There were indications from participants that what is not examined is not taken seriously by both teachers and students. There must therefore be a way of ensuring that the development of environmentally friendly behaviour and consciousness are examined. These can be assessed

better using criteria such as observing beneficiaries within defined environments where the behaviour is expected to show. For instance, students could identify a local problem and find ways of solving it. They could also organise seminars to educate other students or locals on emerging environmental problems and engage them in activities which lead to solving these problems, or they could design and carry out a project in the interest of the environment. These could then be graded to form part of trainees' certification.

Based on reports on the curriculum, it is recommended that the curriculum be restructured to address concerns raised. It should be restructured to produce teachers who are environmentally literate, and action driven. The Behaviour models reviewed in this research can serve as a guide in this direction. Such a restructure could be guided by a policy framework which makes it possible to structure its content right from the basic to the tertiary level. It should be activity based and expository in nature, while concentrating on development of such variables that promote good environmental behaviour (see section 2:2). It is also recommended that EE should be given a separate subject status and the same name from basic to tertiary level to avoid the confusion it currently generates with different names at all levels. Again, the content should also be structured based on the goals it seeks to achieve at each level. In addition to this, EE can also be integrated into other subjects as and when there is an opportunity to do so. For example, there can be a reading passage on pollution or how to improve sanitation in English language.

EE should be a collaborative effort which involves families, schools and the wider society including media, faith organisations, social organisations and so on. They must all be drafted into the whole EE programme and educated (be that through non-formal education) on EE as well as their role in ensuring its success so that, efforts at imbuing students with an environmentally friendly habitus or ecologically conscious habitus is re-enforced at all levels

they are engaged in and in a positive way.

It is also important to acknowledge and engage indigenous knowledge systems or other ways of knowing, in providing formal education and or implementing EE programs, especially as findings of this research has revealed that students and teachers are still inclined to these forms of knowledge systems. This will make the knowledge sector richer with more options or an amalgamation of ideas which work to promote EE.

Teachers who are not qualified to teach EE should not be recruited to teach it. This development gives an indication of the perception recruiting officers have about EE and the kind of competence and expertise that needs to go into its teaching. If it is bad enough that those who are trained and generally qualified to teach EE are facing difficulty in their ability to deliver, then the case of these teachers who are not trained to teach EE can well be envisaged.

10:4:2 Recommendations for Training EE Teachers for Colleges of Education

The universities that train teachers for colleges will need to realign the courses and programs to reflect what teachers are expected to teach at the college level. This will mean working in collaboration with the Institute of Education who design the curriculum for colleges and the colleges of education themselves. Not just in terms of subject content but also in terms of philosophies which guide the teaching of EE. This will ensure that they have the needed capital to operate in a field which will sustain their habitus of practicing such teaching.

Since participant's experiences and perceptions have been found to influence their practice, experiences organised for them during their professional development should take cognisance of this. Related to this may be continues professional development (CPD). Since the habitus (imbued experiences which influence one's action) can be modified, it gives a window of hope for teachers who may not have had such experiences and or may have had 'wrong' experiences, to have their habitus and perceptions re-educated and this can be done through CPD.

The responsibility of CPD should be a shared one initiated by the teachers and this must be made known to teachers throughout their professional development. Having said that, all stakeholders must seek opportunities for such programmes for teachers and the Institute of Education and colleges must make time for teachers to update their professional capacities. It can be as 'simple' as making time within or outside official hours for teacher to interact to share ideas to finding opportunities in courses, programmes or conferences where teachers can update their professional competencies. Relating to this, there seem to be an urgent need to bring the competencies of EE teachers in colleges of education up to date with their expected practice. There is therefore the need to evaluate these competencies of teachers and offer any remedial assistance which may be necessary. The Strategies for training of teachers in Environmental Education published by UNESCO (Wilke, Peyton and Hungerford, 1987) could be a valuable resource in this quest. There is also the need for identifying competencies needed by teachers (Wilke, Hungerford and Peyton, 1980) and through CPD and further studies imbue them with such potentials. According to Wilke *et al*., (1980), the identification of teacher competencies in teaching EE is key and once that has been done, the teacher can then be persuaded to understand that the achievement of these competencies is a necessary component of teacher education, thus necessary for both the teacher and the trainee. As I earlier indicated, a teacher who is not well prepared to teach EE, cannot organise learning experiences and or understand which pedagogies to use for instruction to enable students explore and discover knowledge for themselves. It is important to note that this change needs to be guided by thinking about the goals that needs to be achieved and while planning on these, "It should be borne in mind that there is nothing more difficult to handle, more doubtful of success, and more dangerous to carry through than initiating changes" (Machiavelli, 1961: 21).

10:4:3 General Recommendations

The media must be partnered to deliver EE to all citizens including those in formal education. This is because, the media may not inform, may misinform and or wrongly educate. The media may also rightly inform and correctly educate, all of which affect EE. Engaging the media therefore ensures that the right kind of education is done or that misinformation is corrected. Teachers may also need to be trained on how the media can be used to effectively enhance EE in and out of the classroom.

Based on findings of this research, it is important that where indigenous knowledge forms and practices which promote environmental protection still exist and in places where the sanctity of their beliefs are still preserved even if partly, efforts are made to understand the epistemology of these traditional people in allowing such practices, so that navigating through or around them or even including then in education (both formal and informal), does not occur from misguided grounds.

There are socio-cultural undertones which affect general environmental behaviour (see section 9:3:1:3) and the responsibility of providing 'means to an end' (see section 9:3:1:6) which greatly influence the drive for action in protecting the environment, beyond achieving knowledge and skills and beyond having a passion for the environment must be addressed by all stake-holders.

10:5 My Concluding Thoughts

My journey through this research, from literature to exploration of perceptions and experiences of participants, has left me thinking about our way of thinking as human beings or rather beings in an ecological space. It has left me thinking about what informs our thinking which has led us to an Anthropocene era and as to whether the remedy of this way of thinking (our way of thinking) lies in our thinking itself. These thoughts have brought me right to the

doorsteps of Timothy Morton who states that "one of the things that modernity has damaged in its appropriation of the Earth has been thinking" (Morton, 2008, p. 73). I am inclined to think that this thinking referred to by Timothy Morton, is not only in terms of thinking related to ecology but also of the education that informs our experience, perception and actions towards ecology, the environment, the earth. I have asked myself several questions from the findings of this very study which questions our way of thinking. For example, what informs an officer to recruit a Physical Education teacher to teach Environmental Education? What informs a college teacher to use a lecture approach in teaching and hope that students will magically not only become familiar with a child - centred approach of teaching, but develop the skills or expertise of using such a method to teach upon completion? What informs a curriculum developer to take out crucial components of a curriculum which ensures the achievements of goals of such a programme and replace them with non-related or remotely related topics or to develop a curriculum which is oriented towards students passing exams? The latter question is consistent with the findings of Peim and Flint (2009) who lamented about the educational system being driven, controlled, dictated to and informed by assessment. Martin Heidegger (1996), A German Philosopher of the 20th century in his lecture titled "The Principle of Reason" made the profound statement that 'nothing is without reason'. Indeed, I see it as 'the why of behaviour' itself, why a person will choose to act this way and not that way, brings us to the question of the reason behind it, but further to this is the thinking that went into such reasons that may be given for such an action.

And it may not only be on matters of formal education but may also hold true for the wider community who are inclusive in the EE programme. To illustrate this further, I would share a short experience. During the collection of data for this research, my cousin who drove me to most of the interview centres, insisted on using a big car whose engine used diesel fuel because

he enjoyed driving that car. Even though there was a smaller petrol car and it was just the two of us, he preferred a fully blown air-conditioned car to opening the car windows even though the weather was fairly cool, and it kept me wondering as to what will make one chose not to ride in a car model he loves, or engage the comfort such a machine offers in order to protect the environment? Much as we may love to answer such a question by looking at people, faced with everyday choices and loving comfort as it is in their nature to, evolving into 'environmental saints' who will protect the environment to their discomfort (a situation which is most likely not to happen), I would like to think that there lies an answer also in technology. Using this same example, could this same car have been developed to have all the comfort my cousin desired and still be environmentally friendly? Heidegger (1954) indicates that, everywhere we "remain unfree and chained to technology, whether we passionately affirm or deny it". He explains, we must not presume technology to be neutral less we are blinded to its essence. According to Heidegger and Lovitt (1977), it remains correct that technology is a means to an end and we ought to garner the "will to master it before it slips out of human control". In further reference to technology, Heidegger asserts that, if we are mindful that technology is no mere means, then we will encounter a whole realm of revelation concerning technology. This relation then, links technology to the realm of thinking and I have asked myself if the liberation for humans 'trapped' in this way of thinking about technology, about education which has so far failed to really educate, about the environment which is plagued mainly by the actions of humans and technology can be liberated by technology which itself is the product of human thinking.

We have become so addicted to technology so much so that it has destroyed most personal, family, community, national and international relationships. Families sitting in the same room can decide to tweet or text rather than talk to each other. We are walled in our worlds, our

homes and obsessed with our ‘space’ so much so that the ‘space’ of others relative to ours is becoming meaningless to us. I worry that this has creeped into our educational system and in our relationship with the environment. We think of our immediate environment, children are taught to do the same and once dirt is not within their compound, home or even in ‘their space’ within their home, they are okay. We forget that despite our ‘little barriers’ all animals live in one environment and there are no barriers per se when it comes to the environment. For example, pollution of the Volta River in Burkina Faso will affect the people of Ghana where it flows through. If Ghanaians pollute the Tano River, parts of Ivory Coast will be affected. Air pollution in Britain for instance, can cause acid rain in France. So, despite physical borders, we need to open the borders of our thinking and have a re-think of how to best preserve our environment.

The environment must be saved from humans for humans and other living things and for that to happen (at least through formal education), ecological thinking will have to inform the very foundation of our education to bring us to an understanding that, humans are indissolubly linked to the environment and other living and non-living things which affect and are affected by humans and that we are part of and not owners of the environment. This kind of thinking should then inform how the curriculum is structured and what we seek to achieve by it. If nothing is without reason, then what reasoning should be behind a curriculum that educates on the environment and what thinking should go into such reasons? I would like to conclude my thought on Heidegger (1968) who asserts that, the most thought-provoking thing in our thought-provoking time, is that we are still not thinking.

10: 6 Limitations of the Study

Regarding methodology, this study could have benefitted from classroom observations. This would have independently verified participants professional philosophies and pedagogical

practices. Nonetheless, the focus of the study was to explore the essences of participants experiences which for all intents and purposes cannot be observed as it is based on how the individual experienced and interpreted the phenomenon under study.

The first few interviews were not rich in quality due to my inexperience with conducting interviews. Although the quality improved as the interviews progressed, it was compensated for by many follow- ups with participants to clarify aspects of the interview or to answer further questions from my initial comments of their transcripts.

Finally, although the small sample size used in this research makes it impossible to generalise the findings, the sampling technique and procedures employed ensured an equal representation of participants from all five administrative zones of CoE in Ghana. In addition, the exploration of the EE curriculum, helped to generate representative data for the purpose of making general statements about the curriculum and verifying the participants perceptions of the curriculum.

10: 7 Recommendations for Further Study

Further studies which explores the competence of teacher trainees in teaching EE after completion will give further insights on whether or not the perceptions of participants in relation to trainees' competence to teach EE upon completion was justified.

Also, evaluation of programmes for EE teachers at universities, EE curriculum at colleges of education and that of basic schools will clearly indicated the areas and levels of inconsistencies that need to be addressed.

A study on experiences and perceptions of the wider community on environmental education and environmental issues will give entry point indications as to how non- formal education on environmental issues as well as developing an environmentally friendly habitus with regards to such individuals should proceed.

10:8 Plan for Dissemination of Findings

The findings from this study will be disseminated mainly through peer-reviewed journals and other mediums such as academic conferences. Over the years, parts of it have been presented at academic conferences. Avenues such as conference marking sessions organised by the IoE, UCC where environmental educators are present will be explored to share the findings with teachers, College administrators and agents of the IoE, UCC.

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APPENDIX A

Information Sheet

University of Birmingham
School of Education
Edgbaston
Birmingham B15 2TT
United Kingdom.
29th October 2017.

I am a doctoral student at the University of Birmingham. The purpose of this study is to unearth experiences and perceptions of environmental science tutors in colleges of education in Ghana. Findings will inform curriculum innovation, continues professional development and provide literature for research purposes. You are kindly asked to be a part of this project.

If you decide to participate, you will be asked to meet for a period of approximately 40 minutes at a time and location that suits you. During the interview, I will be asking you questions about your perceptions and experiences of environmental education. The interview will be audiotaped for the purposes of transcribing the session and explicating the data on your experiences and perceptions for my research. I will review the transcription of our interview based on your comments when the transcript is returned to you for validation purposes and following this, you may be asked to participate in a brief follow-up interview (face to face or by telephone) to make further clarifications that may be needed.

Confidentiality

To protect your privacy and anonymity, I will disguise or remove identifiers that could possibly reveal your identity and pseudonyms will be used in material that will be published (unless you prefer otherwise). Furthermore, the name and location of your college will be protected and would not be revealed. For the whole duration of this aspect of the research, all audio tapes and written data will be stored in my home computer and desk and locked, this will limit access only to me during this period. Further, all data gathered for this project will be subject to the data protection policy of the University of Birmingham to ensure a maximum degree of confidentiality.

Risks

Aside your time and any inconvenience the interview may cause, there are no other foreseeable risks.

Benefits

Your experiences and perceptions may benefit the knowledge base on this subject, help in curriculum innovation with regards to environmental education and may contribute to future professional development opportunities in teacher preparation.

Voluntary participation and withdrawal

Participation in this research is strictly voluntary. You may also skip questions that you do not wish to answer. Transcripts of the interview sessions will be given to you for verification purposes and any aspect of the interview you feel uncomfortable with will be taken out if you so desire or replaced with what you wish to state in that space. If you do decide to take part in this project, you will be contributing to research that has the potential to impact environmental education in Ghana. The choice to take part in this project is entirely yours and there are no consequences whatsoever if you decide not to participate. However, after you have participated you will have up to two weeks to make your decision known to the researcher if you decide that information you gave during the interview should not be used for this project.

If you have any questions about this research or would like to know more, you may contact me on any of the following addresses , on phone or my supervisor

This project has been approved by the University of Birmingham. If you have questions concerning the university's rules for research, please visit the university's website at www.bham.ac.uk or contact the director of research at the school of education, professor David Gillborn on +44(0) 1214144835 or d.gillborn@bham.ac.uk

Thank you.

Yours sincerely,

Juliet A. Atuguba (Principal researcher)

Dr. Nick Peim (Lead Supervisor)

Consent Form

I agree to take part in this project. I understand the purpose of this study and what is required of me as a participant. I have been informed that the interview would be audio taped and am also aware that I can withdraw from participating at any time without any consequences. I am also fully aware that should I decide that the interview should not be used for this research, I have two weeks after the interview within which time I should make my decision known to the researcher through email, postage or telephone call or text message.

Name or initials (optional)_____

Participant number_____

Signature_____ Date _____

Appendix B

Matrix for Interview Guide -C2

Research question	Issues of interest	Interview questions
How do environmental science teacher educators perceive environmental education (EE)?	Perception of EE in terms of; **a**) Basic concepts on EE. **b)** Tutor awareness of what EE involves. **c**)What should be taught and how?	**a**) What does the environment mean to you? **a**) What is EE and how important is it? **b**) What key components should be addressed in teaching EE? **b**) What are the current environmental issues that you think should be factored into teaching environmental education? ***Prompts*** (Global, national and local environmental issues. Are they captured in the curriculum presently?) **c**) What key areas should be addressed in teaching EE? Are you able to address these? **c**) Do you think the current curriculum addresses issues of environmental education adequately? How? [give examples] **c**) What methods do you employ in teaching EE?

What are the experiences of teacher educators in teaching EE in colleges of education in Ghana?	**a**) Experiences through professional development	**a**) What has been your experience in your training to teach EE? ***Prompts*** (Relevance of course work, competence in teaching EE) **a**) How has this experience shaped your perception and teaching EE? **a**) Have you attended any refresher courses on teaching EE?
	b) Experiences in teaching EE	**b**) What has been your experience so far teaching EE? ***Prompts*** (Challenges, successes, etc, students' response & participation) **b**) Do you consider cultural, traditional or religious beliefs and practices and backgrounds concerning environmental issues and EE (traditional taboos, communal labour, creation stories, sacred forests, etc.) in your teaching process? Why? **b**) In teaching courses in environmental education is there any experience that has stuck with you?
	c) Experiences growing up	**c**)What, Where and how did you learn about the environment growing up? How has these experiences influenced the way you relate to the environment and teaching EE?

From the perspective of tutors, how prepared are pre-service teachers to teach EE?	Preparedness of pre – service teachers to teach EE. **a**) Pedagogies used to teach EE **b**) Approach used in EE. **c**) Competence to teach and acquired, behaviour exhibited and positive attitude towards the environment. **d**) Assessment of EE	 **a**) What pedagogies should be used to teach EE at the basic level? **a**) What pedagogies do you use in teaching EE? **a**) Are there any important distinctions you make to your students between methods of teaching science and EE? Explain? **b**) Should EE be integrated or taught as a stand-alone subject? Why? **c**) What should students acquire to be able to teach EE competently? **c**) Do you think EE given to pre-service teachers equips them well to teach upon completion? Why do you say so? What do you suggest should be done? **c**) Have you observed any behaviour change in your students in relation to the environment that you can attribute to what they learnt in EE? **d**)How do you assess students in EE?

Appendix C

Interview Guide- C1

1. Greeting.
2. Thank participant for willingness and making time to participate in this study.
3. Rehash purpose of study and of interview (E.g. I will be asking you questions on …)
4. Reminders
   - Remind participant that interview will be tape- recorded. (As I explained on the information sheet previously, this convention will be recorded so I can ensure that your views are well captured and represented accurately)
   - Inform participant that notes will be taken.
   - Readdress issues on confidentiality and data storage safety.
   - Remind participant of voluntary nature of research and rights available to him or her.
5. Review and sign two consent forms (the participant keeps one of the forms).
6. Do you have any questions before we begin?
7. Re-check to make sure the tape recorder is functioning properly.
8. Create comfortable atmosphere. Pick on an earlier lead of discussion (if there was one) and keep it short. It can be on demographics or just on the teaching profession, just about enough to make participant comfortable.
9. Go through questions on interview guide C2
10. Thank participant. I am extremely grateful and do appreciate the time you spent sharing your experiences and thoughts with me on environmental education.
11. Remind participant that he or she may be contacted if need be. (I will be preparing a transcript of our interview for review and may contact you if clarification is necessary). Also remind participant of how to contact you, your supervisor or school of education in relation to this study. Also mention that a copy of this transcript will be sent to him or her for verification and clarification purposes so that his or her views and experiences relating to this research are accurately represented.

Appendix C

Interview Guide -C2

Interview Questions

7. What does the environment mean to you?
8. How important is Environmental education (EE)?
9. What are they key components that should be addressed in teaching EE?
10. What are the current environmental issues that you think should be factored into teaching EE?

    Prompts (Global, national and local. Are they captured in the curriculum presently?)
11. Do you think the current curriculum addresses issues of EE adequately? How? (give examples)
12. Should we be concerned about how EE is currently integrated in the curriculum? why?
13. Do you think EE given to pre-service teachers equips them well enough to teach EE? Why do you say so? (What do you suggest should be done?)
14. What has been your experience in terms of your professional development or training to teach EE? ***Prompts*** (relevance of course work (content and methods), competence in teaching EE. How has this experience shaped your perception of EE and how you teach it?
15. Have you attended any refresher courses on teaching environmental science or EE? How many in a year? How beneficial are they?
16. What has been your experience so far teaching EE? ***Prompts*** **(**Challenges, successes, methods employed, assessment, resources, students' response & participation)

- Are students able to execute projects based on environmental issues or use problem solving cases in teaching EE?
- Do you consider traditional, cultural or religious backgrounds concerning environmental issues and environment education in your teaching process? Why?
- In teaching courses in EE is there any experience that has stuck with you?

- What methods do you use in teaching EE and why?
- How do you assess students in EE?
- Have you observed any behaviour change in your students in relation to the environment that you can attribute to what they learnt in EE?

17. What, Where and how did you learn about the environment growing up? How has these experiences influenced the way you relate to the environment and teaching EE?
18. What other experiences related to EE would you like to discuss that I have not addressed directly in a question?

Appendix D
Demographic Survey

Name (optional):

Participant assigned research number:

1. What course do you teach? Science ☐ Social studies ☐

2. Sex Male ☐ Female ☐

3. Can you please state the title of your bachelor's degree(s) as stated on your transcript?

4. Can you please state the title of your master's degree(s) as stated on your transcript?

5. Do you have a doctoral degree? Yes ☐ No ☐

6. If you answered Yes for question 5, please state the major area of your doctoral research and if applicable your minor area of study.

Major:

_____

Minor

_____

7. Do you hold a teaching certificate (s)? Yes ☐ No ☐

8.What type (s) of teaching certificate (s) do you have?

9. What are your areas of expertise? (you may describe)

10. How long have you taught environmental science at college level?

11. Did you have any experience in teaching environmental education prior to you teaching it in college? Yes ☐ No ☐

12. If your answer is Yes to question 11, at what level (s) did you teach it and for how long?

13. In terms of pedagogical content knowledge for teaching environmental science education, please rate your level of comfort

(1 = novice, 2 = good, 3 = quite good, 4 = very good and 5= expert)

14. Have you taken any course (s) on teaching environmental education? Please state

Thank you very much.