ZAMBIAN TEACHER EDUCATORS' PERCEPTIONS OF ENVIRONMENTAL EDUCATION AND THEIR PARTICIPATION IN ITS TEACHING AT KITWE AND MANSA COLLEGES OF EDUCATION

By

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Author's Declaration

I, *Lukonde Derrick Chileshe*, do hereby declare that this dissertation represents work and that it has not previously been submitted for degree at the University of Zambia or any other university.

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Certificate of Approval

This dissertation of **Lukonde Derrick Chileshe** is approved as fulfilling the requirement for the award of the Master of Education degree in Environmental Education by the University of Zambia.

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Dedication

To my daughters, Bwalya and Mulenga, and above all to my ever wonderful and merciful Lord, whose love never ceases to amaze me!

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To you all, may the good Lord Jesus Christ richly bless you and stay blessed

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Acronyms

CDC	–	Curriculum Development Centre
CPD	–	Continuous Professional Development
EA	-	Expressive Arts
ECZ	-	Environmental Council of Zambia
EE	-	Environmental Education
ES	-	Education Studies
ESD	–	Education for Sustainable Development
FGD	-	Focus Group Discussion
HE	-	Home Economics
HoS	-	Head of Section
KCE	-	Kitwe College of Education
LLE	-	Literacy and Languages Education
MACE	-	Mansa College of Education
MoE	–	Ministry of Education
ME	-	Mathematics Education
MSE	–	Mathematics and Science Education
MTENR	-	Ministry of Tourism, Environment and Natural Resources
NPE	-	National Policy on Environment
PTDDL	-	Primary Teacher's Diploma by Distance Learning
SADC	-	Southern Africa Development Countries
SE	-	Science Education
SSME	–	Social, Spiritual and Moral Education
TESS	-	Teacher Education Specialised Services
TS	-	Technology Studies
UNEP	–	United Nations Environment Programme
UNESCO	–	United Nations Educational Scientific and Cultural Organisation
WWF	–	World Wide Fund for Nature
ZATEC	–	Zambia Teacher Education Course

Abstract

All teacher educators in Zambian Primary Colleges of Education by policy are expected to include Environmental Education (EE) in their lessons as a crosscutting issue. But EE as a crosscutting issue has no specific ontent to teach and is usually ignored by such teacher educators. To address this problem, the general aim of the study was to evaluate and explore the respondents' (that is, teacher educators) perceptions of EE and their participation in its teaching at Kitwe and M eges of Education. The specific objectives of the study sought to determine the views of selected teacher educators on teaching EE as a crosscutting issue; to assess the degree of teacher educators' participation in teaching EE; to investigate the challenges encountered by teacher educators in implementing EE using the crosscutting approach and to establish training needs of teacher educators involved in teaching EE in Zambian Colleges of Education. The study adopted both qualitative and quantitative research approaches, and employed questionnaires, observations guide and focus group discussions guide as research instrume s. Content analysis was also used to ascertain teacher educators' participation in E. The study sample comprised 33 college teacher educators who were purposively selected to participate in the study. The data was analysed both qualitatively and qu ntitatively. The major findings revealed that respondents' views of EE were associated with creation of awareness about the environment and they narrowly view EE in terms of nature conservation. EE was viewed both as a main and extra curricular activity. The study also revealed that EE was only taught as topics or subtopics in Science Education (SE), Social and Spiritual Moral Education (SSME) and nology Studies (TS) and not as a crosscutting issue across the curriculum. The challenges experienced in implementing EE were lack of knowledge and skills, unclear curriculum, lack of resources, pressure of time due to an overloaded curriculum, lack of clear policy to guide its teaching and negative attitudes of respondents toward its teaching. Most respondents had neither received pre-service nor in-service training in EE and if they did receive such training then it was irrelevant to th work they were doing. The study concluded that EE should not end at creation of awareness about the environment but it should be linked to knowledge, skil and attitudes required to act for the environment. As a key recommendation, extra curricular activities should be fully utilised in teaching EE and that there was an urgent need to train or reorient teacher educators in the two colleges on how they coul teach it. Such training should be extended nationwide to all the Zambian Colleges of Education. Moreover, there is need to reorganise the curriculum in order to make the teaching of EE sustainable.

Chapter One

Introduction

1.0 Introduction

This chapter outlines the background to the research problem under study, the statement of the research problem, the purpose of the study, research questions and objectives, significance of the study, the delimitation of the study and operational definitions of terms used in the study.

1.1 Background to the Problem

Over the past 30 years, the environment in Africa has continued to deteriorate, resulting in a type of environmental change which is making more and more people in the region vulnerable due to increased risk and inadequate coping capability (United Nation Environmental Programme (UNEP), 2002). he deterioration of the environment facing Africa has not spared Zambia. Studi carried out in all the provinces in Zambia have confirmed the worsening environmental situation. According to the Ministry of Tourism, Environment and Natural Resources (MTENR), (2007), Zambia's wealth of natural and cultural resources are in d r of further widespread depletion and degradation, somet irreversible as in the case of misuse of some soils. The worsening environmental situation in the country calls for urgent measures to address the impact of this environmental change. The Zambian National Policy on Environment (NPE) explains that it is the duty of any institution, government or non-governmental organisation, any community group or people's organisation or any individual that uses or carries out activities that affect the environment in any way, to exercise proper control to maintain the productivity and integrity of the environment (MTENR, 2007).

Meanwhile, Chapter 36 of Agenda 21 recognises that education should be a process by which human beings and societies can reach their fullest potential and is critical for promoting sustainable development and improving th capacity of people to address environmental and developmental issues (United Nations Educational Scientific and Cultural Organisation (UNESCO), 2002). Environmental Education (EE) was introduced as a measure of creating awareness about effects of environmental change. Thus, it is one of the emerging responses to the environmental crisis (Le Roux, 2001, MoE, 2006). EE pa adigm is broadened by

Education for Sustainable Development (ESD) and it addresses not only aspects of nature conservation and environmental quality, but also societal and economical aspects (Beckford, 2008; Mfune, 2008).

In Zambia, the field of EE is relatively new (Namafe, 2006) and the need to introduce and integrate EE into the Education system was recognised to be one of the most effective ways of ensuring that environmental man ment occupies a significant role in the society (Mweemba, n.d). One strategy of achieving EE and public awareness was through mandatory EE in all formal and non-formal education institutions (MTENR, 2007). However, EE was also carried out in informal education system although not emphasised in NPE. In non-formal education system, EE is targeted at both the literate and non-literate people who are out of formal learning institutions (Oduro-Mensah 1992; ECZ, 2000). The Ministry of Education through its National Policy on Education, 'Educating Our Future' recognises the need to produce a learner capable of participating in he preservation of the ecosystem in one's immediate and distant environments oE, 1996). Formal EE has been introduced in principle, in colleges of education and schools through the Ministry of Education (MoE). The recognition of EE in learning institutions by both MoE and MTENR calls for competent environmental educat s to implement it. Teacher education institutions and teacher educators have been identified by UNESCO as key change agents in reorienting education t address sustainability (Mckeown, n.d.).

Primary Colleges of Education are involved in the training of both pre-service and in-service teachers responsible for EE implementation in primary schools. Previously, EE was undertaken as a separate subject (Module 5) at Chalimbana National In-service Teachers' College (NISTCOL) for primary school teachers pursing Primary Teachers' Diploma by Distance Learning (PTDDL). However, at pre-service teacher training colleges and school levels, EE is not taught as a separate subject or study area but as a crosscutting issue. Musonda (1999) outlined that EE is identified as an area of concern that cuts across disciplines and there ore, tries to synthesis knowledge pooled from several disciplines. Hence, every lecturer in all study areas is expected to teach it in some form or the other in the (Namafe, 2008). This entails that all lecturers in colleges of education should be knowledgeable and competent to deliver EE in their lessons. MoE (1996) acknowledges that teacher

quality is the key to meaningful personal and national development and that the quality and effectiveness of an educational system dep ds on the quality of its teachers. Therefore, the availability of qualified and competent environmental educators in colleges of education and schools is crit to its effective implementation and survival.

Previously, in the Zambia Teacher Education Course (ZATEC), EE was taught in Mathematics and Science Education (MSE) and Social Spiritual and Moral Edu ion (SSME). These study areas were considered as carrier subjects of EE in colleges of education as they contained some environmental topics. However, mounting concern over environmental problems promoted greater support for an educational approach which did not only consider immediate environmental improvement an actual goal, but addressed education for sustainability in the long term (MoE, 2006). This led to the adoption of the crosscutting issue approach in teaching EE in learning institutions. Using the crosscutting issue approach, EE was supposed to be taught across the college curriculum, that is, in Literacy and Language Education (LLE), Education Studies (ES), Mathematics Education (ME), Science Education, Social Spiritual and Moral Education, Expressive Arts (EA) an Technology Studies (TS) study areas. Namafe (2006) pointed out that the place of EE clearly needs to be planned for within the practice of the college.

A study area in primary college of education is formed from a group of contributory subjects and usually each contributory subject has a teacher educator responsible for teaching it. Within each study area, teacher educators plan what, when and how to teach given knowledge and skills using integration approach. It is in this arrangement that EE is supposed to be taught using the crosscutting issue approach. With this teaching arrangement for EE in colleges of education c rricular, Namafe (2008) observed that there seemed not to be a definite way to ensure that EE was taught as expected in colleges of education. Gough (2009) also noted that there was recurring testimony to the almost universal lack of successes in introducing coherent or consistent programmes of EE into teacher education course.

EE therefore, does not exist as a separate study area in primary colleges of education curriculum or is not broken into specific contents or outcomes. There are no specific teaching guidelines to direct its teaching. To this effect, Namafe (2006) asserted that

innovations and creative ways are expected from environmental educators to critically review a range of past, present and future issues. It is through innovations and creativity that the teacher educators have to identify what and how to teach EE. Innovations and creativity can only be initiated if the educators are trained on how to incorporate a wide variety of topics within each disci line (Otiende *et al*, 1997).

EE requires special training and commitment because it needs a different focus and outlook that many prospective teachers had not experienced in their education (Tilbury, 1997). According to Agrawal and Aggarwal (1996) the majority of existing teachers had graduated from teacher training colleges nd universities at a time when the importance of EE was not so apparent. In order to mprove the efficiency of teacher educators in EE in Zambia, World Wide Fund for Nature (WWF) in 2000 conducted a five days training workshop on the use of EE Tutors' Handbook in each college of education. Moreover, WWF conducted one month training session from 2003 to 2004 in management of community EE project for some selected college teacher educators. It was hoped that the college teacher educators trained under WWF would later be EE trainers of trainers in colleges of education. Apart from these short-term organised training sessions, the University of Zambia offers postgraduate and undergraduate programmes in EE.

1.2 Statement of the Problem

EE is one of the crosscutting issues included in the Primary School Teacher Education curriculum by the Zambian Ministry of Education. As a crosscutting issue, EE has no specific content, outcomes or teaching methods included in the syllabus which college teacher educators are supposed to use when teaching it. Namafe (2008) observes that the position of EE in the colleges was precarious because of expectations that as a crosscutting issue, every study area should teach it in some form or the other. Namafe (*ibid*) further noted that there seemed not to be a definitive way to ensure that EE was taught as expected. In addition, most college teacher educators who are supposed to teach it had graduated from teacher training colleges and universities at a time when the importance of EE was not so apparent. In short, many teacher educators in colleges of education have no training in EE and little has been done to evaluate their perceptions of EE as a crosscutting issue. Such a situation constitutes a problem because EE tends to be ignored by such teacher educators. Therefore, the study seeks to explore and evaluate the teacher educators'

perceptions and levels of participation in teaching EE in Primary Colleges of Education in its current form as a crosscutting issue.

1.3 Purpose of the Study

The study explored and evaluated the views and level of participation of college teacher educators in teaching EE as a crosscutting issue in the Zambian Primary Colleges of Education.

1.4 Aim of the Study

The main aim of the study was to explore and evaluate college teacher educators' views and participation in teaching EE as a crosscutting issue in the Zambian Primary Colleges of Education.

1.4.1 Objectives of the Study

The objectives of the study were to:

a. determine the views of teacher educators on the teaching of EE as crosscutting issue in Zambian Colleges of Education.
b. assess the degree of participation of teacher educators in teaching EE as crosscutting issue in colleges of Education.
c. investigate the challenges encountered by teacher educators in implementing EE as a crosscutting issue in colleges of education.
d. establish training needs of teacher educators in EE in Zambian colleges of education.

1.4.2 Research Questions

The following were the specific research questions of the study:

a. What are the views of teacher educators on the teaching of EE as a crosscutting issue in colleges of education?
b. How do teacher educators teach EE as a crosscutting issue in colleges of education?
c. How effectively is the crosscutting issue approached by teacher educators in teaching EE in colleges of education?
d. What are the training needs of teacher educators in colleges of education in EE?

1.5 Significance of the Study

The results of the study may be used by Teacher Education Specialised Services (TESS), Curriculum Development Centre (CDC) and college teacher educators to improve the quality of teacher education and ultimately the basic school education. According to UNESCO (2006) teacher education like the whole idea of school is questionable in many countries today despite all attempts of restructuring it. It still appears to be far from meeting the expectations of the society and of its major stakeholders. The Ministry of Education has been attempting to restructu e teacher education through among others, reviewing the Zambia Teacher Education Course curriculum in which crosscutting issues were included (MoE, 2008).

The inclusion of EE as crosscutting issue in primary teacher education curriculum brings in a question of whether teacher educators are competent to effectively integrate it in their lessons or not. In the event of incompetency among the college teacher educators, TESS may find the study findings us as it will provide data to inform in-service training programmes in EE, and procuring and supplying teaching resources to colleges of education. CDC may use the research findings to redesign the curriculum and redefine the status of EE in primary teacher education curriculum for it to be responsive to the current environment challenges the country is experiencing. College teacher educators who are expected to interpret and implement EE as a crosscutting issue in their classroom practice may also find this study useful. The research findings may arguably call for re-adjustment of teacher educators' practice in the classroom through planning, implementa ion and assessment. Ultimately, the study could contribute to improving the quality of teacher educati n through addressing issues surrounding the teaching of EE as a crosscutting issue.

Furthermore, EE is a new field in Zambia as pointed out by Namafe (2006) and that there was limited literature about local EE activities (Phiri, 2008). Hence, through this study, it was hoped that an extra and quality literature on EE in Zambian Primary Colleges of Education would be made available to guide policy formulation, the training of EE teacher educators and its implementation.

1.6 Delimitation

This study was confined to teacher educators teaching in public primary colleges of education training pre-service teachers for lower and middle basic schools. Only

colleges of education managed by the Zambian Ministry of Education were considered.

1.7 Operational Definitions of Terms

The terms 'crosscutting issues', 'environmental education', 'integration', and 'teacher educators' are key terms to this study. In th context of this study, these terms shall mean the following:

1.7.1 Crosscutting Issue

Crosscutting issue is a theme that overlaps between and among the study areas, and is taught in all study areas by all teacher educators.

1.7.2 Environmental Education (EE)

EE is the teaching of the environment which is one of he seven cross cutting issues included in primary college teacher education curriculum. It is an approach f teaching and learning about the environment and taking care of it.

1.7.3 Integration

Integration is the inclusion of environmental issues in a normal study area lessons. Teaching of environmental issues on their own in a separate lesson is not integration.

1.7.4 Teacher Educator

In this study, teacher educator is solely used to imply senior lecturers and heads of sections who are directly involved in teaching EE in the two colleges.

1.8 Overview of the Dissertation

The remainder of this dissertation is divided into five chapters. Chapt Two looks at the literature pertaining to perceptions, integration d participation of teacher educators in EE. Chapter Three focuses on the methodology used to carry out the study while Chapter Four presents the findings of the study and analysis of the findings. Chapter Five examines the issues rising from the analysis of results and lastly, Chapter Six presents the conclusion and recommendations of the study.

Chapter Two

Review of Literature

2.0 Introduction

This chapter reviews literature on EE in teacher education institutions. The historical background, the definitions and perceptions of EE, app oaches to teaching EE, past studies on EE and training of teacher educators in EE have been presented and discussed.

2.1 Historical Background

The nature of EE has evolved within the framework of a increasing awareness of the relations existing between man-made (social, cultural, political, economic and technological) and natural (atmospheric, geological, biological and hydrological) systems. Although EE has a rich heritage sometimes dat very far back, its renewal and unprecedented importance in the educational field esult mainly from awakening of public consciousness in the face of such serious probl ms as overpopulation, pollution, the use and availability of natural resourc , and the general degradation of certain natural sites (Sytnik *et al,* 1985).

A review of the EE literature reveals that there was little concern to integrating the environment into classical and non-classical learning situation in the 1960s. However, from 1970 onwards, the urgent character of environmental problems became more and more evident and in recent years there has been a wide diversity of books and documents that refer indiscriminately to such terms as 'environmental education', 'ecological education', 'education for the environment' (Rao and Reddy, 1997). It can be deduced that the roots of EE in formal learning situations took place in the 1970s and it was prompted by the serious levels of environment problems. In Zambia, the field of EE was relatively new (Namafe, 2008). This implies that EE was not fully established in learning institutions and therefore, many challenges affect its implementation (Mtaita, 2007).

However, Agenda 21 called for the re-orientation of EE towards sustainability (Tilbury, 1995). Since the late 1990's the concepts 'Sustainability' or Education for Sustainability (EfS) or Education for Sustainable Development (ESD) have taken root. It has been conceived as reflecting development at meets the needs of the

present without compromising the opportunity of the fu ure generations to meet their own needs (Mckeown & Hopkins in Mtaita, 2007). Within the environment-related education, EE was aggressively and extensively 'rebadged' as ESD. There is a strong attempt internationally to supplant the use of the ter EE with the new term ESD. Most of these attempts are associated with the current United Nations Decade of Education for Sustainable Development- UNDESD (Robottom, 2007). However, in this dissertation the term EE is used to embrace ESD and EfS, as both ESD and EfS have grown out of EE in spite of their differences in terms of objectives and outlook. This is in line with Mfune (2008) who stated that EE paradigm is broadened by Education for Sustainable Development. It is important to note that the differences between EE and ESD are beyond the scope of this dissertation.

2.2 Goals of EE

EE focuses on three goals which provide the foundation for much of what has been done in the EE field since 1978. UNESCO (1985) outlines the goals of EE as;

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

Despite the massive research, critique, and expansion of these three goals, they still stand as a strong foundation for an internationally sh red view of the core concepts and skills that environmentally literate citizens need. These goals in the researcher's view forms platform on which the perceptions of EE and people's participation in it depend.

2.2.1 Objectives of EE

Although the range of possible EE objectives is practically limitless, some of these have received particular emphasis in literature and practice. UNESCO (1985) outlines the objectives of EE as:

a. awareness – to help social groups and individuals acquire an aware ess of and sensitivity to the total environment and its allied problems.

b. knowledge – to help social groups and individuals gain a variety of experiences in, and acquire a basic understanding of the environment and its associated problems.
c. attitude – to help social groups and individuals acquire a set of values and feelings for the environment and the motivation for actively participating in environmental improvement and protection.
d. skills – to help social groups and individuals acquire the skil s for identifying and solving environmental problems.
e. participation – to provide social groups and individuals with an oppor unity to be actively involved at all levels in working towards resolution of environmental problems.

Comprehension of the objectives of EE is very essential for the successful formulation, implementation and evaluation of EE programmes. In the researcher's view failure to fully comprehend the objectives may result in improper implementation of EE programmes. However, a critical e amination of EE objectives, raise the question of what activities form EE. Does the implementation of any one of the above objectives imply that EE has been effectively achieved? This study attempts to explore the teacher educators' perceptions of EE and their participation in teaching it in Zambian colleges of education. The teacher educators' views on teaching EE may vary according to their personal or institutional interpretation of EE objectives. In view of this, it is possible that some college teacher educators may concentrate on implementing only certain objectives while leaving out some. In the researcher's view this could be a cause for a recurring testimony to the lack of success in introducing cohere or consistent programmes of EE into teacher education courses, despite many efforts (Gough, 2009).

2.2.2 Principles of EE

UNESCO (1986) outlines the following principles of EE;

a. Consider the environment in totality, natural and built technological and social, economic, political, cultural, historical, moral, spiritual and aesthetic.
b. Be a continuous life long process beginning at the pre-school level and continuing through all formal and non-formal stages of education.
c. Be interdisciplinary in its approach drawing on the sp cific content of each discipline in making possible a holistic and balanced perspective.

d. Examine major environmental issues from local and national points of view so that learners can know about the environmental conditions in different geographical areas.
e. Focus on current and potential environmental situations while taking into account historical ones.
f. Promote the value and necessity of local or national and international co-operation in the prevention and solution of environmen al problems.
g. Enable learners to have a role in planning their learning experiences and provide an opportunity for making decisions and accepting their consequences.
h. Help learners discover the symptoms and real causes of environmental problems.
i. Emphasise the complexity of environmental problems and the need to develop critical thinking and problem solving skills.
j. Use diverse learning environments and broad educational approaches in teaching and learning about and from the environment with due e asis on practical activities and first hand experience.
k. Be a response to environmental crisis.
l. Aims to develop an individual's understanding, skills and feelings of empowerment that are necessary for both positive behaviour towards the biophysical and social environment in everyday living, and for active participation in groups efforts to find the optimal solutions for environmental problems.

These guidelines indicate that EE is a process which i pires values and illuminates concept of sustainability so as to develop skills and attitudes needed in understanding and appreciating interactions between man and his environment. According to UNESCO (1985) EE should be education that stimulates civic action, decision making and the elaboration of a personal code of conduct with regard to problems concerning eco-development and the quality of life. However, it should be noted that from the principles of EE, there is no common EE as it depends on the environmental crisis and the location in which the crisis is. Therefore, the way EE will be taught will vary according to the location of the colleges and the prevailing environmental issues in the area. There is no universal EE (Pandya, 2000).

2.3 Definitions of EE

Attempts to define EE are generally prescriptive. Different scholars try to give an account of what EE should be like, often by providing theoretical arguments to support a particular view. For example, Janse van Rensburg and Talyor (1993) in L Roux (2001: 56) define EE as "planned process which enables participants to explore the environment, to investigate recognised concerns and takes action to make the world a better place for all living things." Similarl , Wal et al (1990) in Le Roux (2001:56) defined EE "as the process that enable stude d teachers to participate more fully in planning, implementation and evaluation f educational activities aimed at resolving an environmental issues that learners have identified." It can be seen from both definitions of EE that the authors were trying to define EE using the activities that are needed to achieve it through education. Both definitions describe a series of activities leading to sustainable management of the environment. According to www.isbul.ac.uk, discussion of the roles and definitions of EE are often prescriptive, and does not necessarily relate closely to EE practice. However, in the above definitions of EE, elements of EE objectives and principles formulated at the Tbilisi conference form the basis of the definitions.

MoE (2006) also noted that like environment on which it depends EE has carried a lot of definitions depending on the individual/institutional contextual preferences. Deducing from the above discussion, in the researcher' view, defining EE is problematic as there is no universal definition. Howev r, the International Union for the Conservation and Nature and Natural Resources (1970) definition for EE was adopted at Tbilisi conference and is widely accepted. It defines EE;

> "...as a process of recognising the value and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the interrelatedness among man, his culture and his biophysical surroundings. Environmental Education also entails practice in decision making and self-formulation of a code of behaviour about issues concerning environmental quality (IUCN, 1970: 37)".

2.4 Perceptions of EE

O'Donoghue in Le Roux (2001) explains that it is useful to think of not as a subject or body of knowledge but as processes of learning which take on different meanings in different contexts. It is...

> "... more appropriate to talk of EE processes rather than EE as a 'thing'. The processes addition draws attention to the multiple forms of environmental education, the evolving fluidit of the concept and the open-endedness of environmental education aims and methods. Environmental education processes differ n different contexts; thus it is appropriate to talk of processes ch arise to take appropriate shape in differing situations (Le Roux, 2001:57)."

Le Roux (2001) perception of EE as a process is also shared by Jekanyinfa and Yusuf (2005). EE should be viewed as an approach to education (Jekan a & Yusuf, 2005). However, Jekanyinfa and Yusuf (2005) further explain that EE should not only be made as a study but also as a way of life and the way of improving the quality of life of each individual who goes through th course. It is quite interesting the way Jekanyinfa and Yusuf (ibid) have perceived EE as a way of life. It fits well with the goal of EE which requires individuals to create new patterns of behaviour towards the environment.

EE is also described as a subject of varying practical nature and supported sound pedagogical principles while other educators consider it as a global movement established at the United National conference on the Human environment held in Sweden (Rao & Reddy, 1997; Otiende *et al*, 1997). It is interesting to note that there is no single perception of EE as it has been perceived differently by various educationists and thinkers (Rao and Reddy, 1996). With this background, in the researcher's view teaching EE poses a serious challenge to educators as within the same institution, it may be perceived differently.

However, at colleges of education, pre-service training level in Zambia there is no specific study area or subject called EE but it has been included as a crosscutting issue in the curriculum (MoE, 2006). The adoption of t crosscutting issue approach of teaching EE by the Ministry of Education and not as a separate subject simply implies that EE is considered as a process (Jekanyinfa and Yusuf, 2005; Le Roux, 2001; Singh 1998). How do college teacher educators perceive EE? According to Agrawal and Aggarwal (1996) prospective teachers may often have misgiving about it, since there are many interpretations of EE. This study aimed to explore college teacher educators' perceptions of EE and their participation in its teaching in colleges of education. What are the implications of teaching EE with various interpretations? Mtaita (2007) explains that if EE is not understood by practitioners, it seems unlikely

that they would undertake a step towards implementing it. Incorporating EE depends on teachers' views and understanding of teaching and learning of EE (Hart 2003). According to Mtaita (ibid) teaching, like learning is a personal activity with trong basis in perception and action. Therefore, teacher educators' views on EE are considered important for their involvement in EE to be realised.

2.5 Approaches to EE

To a great extent, a person's specific view on environmental issues and their individual environmental approach influences the way t approach and conduct EE (Sandell *et al,* 2005). The 'correct' approach towards EE is also deter ined by how one perceives education in general, that is, the educational philosophy. The educational philosophy encompasses general ideas on the role and purpose of schools in society, as well as that which directly affect the teaching process. Within the education philosophy, selective traditions represent a number of solutions to what constitutes the best form of teaching within a su and also include different approaches in both, the choice and organisation of content as well as the choice of teaching methods (Sandell *et al,* ibid).

EE evolves around three central themes, each of which represents a particular stage; education in which the environment represents a means, education concerning the environment, and education of the individual as a person living in an environment of a given quality and who is partly responsible for that quality (Sytnik *et al,* 1985). The themes outlined by Sytnik *et al,* (1985) fit well with Sandell *et al,* (2005) selective traditions of EE which are labelled as Fact-based EE, Normative EE and Education for Sustainable Development. These three selective traditions of EE describe different ways of understanding the correct form of EE that has developed in schools. Each selective tradition has got its own unique characteristics as shown in Table 2.1 on the next page.

Table 2.1: C**haracteristics of Different Traditions of Approaching EE**

Traditions of Environmental Education	**Fact-based Environmental Education**	**Normative Environmental Education**	**Education for sustainable development**
Central subjects and areas of knowledge	Natural sciences	Natural sciences and aspects of social sciences	Economical, social and ecological perspectives as well as ethical and aesthetical aspects
Organisation of lessons and teaching materials	Separate subjects	Thematic	Integrated
Time perspective	Present	Present and future	Future in relation to the past and present
Geographical perspective	Local	Local and global	Local, regional and global incorporated
Main method of teaching	Factual information from the teacher to student	Student active in the development of knowledge and values	Critical discussions based on a number of alternatives
Students	Passive	Active	Active and passive
Planning and democracy	Teachers plans based on observations and experiences of students' input	Teacher and students plan together	Students plan under teacher supervision

Source*: Sandell et al, (2005:167)*

A closer examination of the themes outlined by Sytnik *et al* (1985) and Table 2.1 suggest that the teaching of EE should proceed from th me one or fact-based EE to theme three or ESD through the second theme or normative EE. Since EE is a new field in Zambia, it would not be surprising to find th most teacher educators were operating in the first two themes namely fact-based and normative EE.

Sytnik *et al* (1985) and Sandell *et al* (2003) conception of EE can also be viewed as forms of EE practice. This model analyses EE as '*in*' (or '*through*'), '*about*', and '*for*' the environment (www.isbul.ac.uk). Education '*through*' or '*in*' the

environment means developing skills using the environment as a res ce. Education *about* the environment means developing knowledge. It aims at providing learners with practical knowledge about the environment and the impact humans have on it. Education *for* the environment means developing values. This approach of EE develops a consciousness and deep concern about the living environment and promotes responsibility for taking care of and protecting it. The ctive of this form of EE is to develop attitudes and levels of understanding which influence people to take collective action that will positively enefit the earth.

UNESCO (1985) stressed the primacy of '*for*' the environment as the ultimate goal of EE, with an emphasis on this approach as a personally and socially transformative activity. The growth of support for '*for*' the environment has gone hand-in-hand with the rise of concern about the environment. Some argue that there is a danger of developing forms of EE that are too orientated towards 'saving the environment', thus risking losing the educational values of development of students and their capacities. In the researcher's view, this danger can only arise when students are given tasks to perform without first creating awarenes , knowledge and understanding to as why they are performing that activity. It is important to note that the three common ways to approach EE, that is, *about*, *in* and *for*, combined, they provide a holistic approach enabling individuals and groups to acquire the knowledge, values, attitudes, commitment and skills needed to protect and improve the environment (www.isbul.ac.uk).

2.6 Teaching EE in Formal Education

There have been numerous developments associated with EE policy and strategy development across the Southern African Development Community (SADC) region (Allen and Springall Bach in Lotz-Sisitka, 2005). Numerous policies have been developed, but many of them were not 'in use' or were not effectively implemented. It was also noted that much attention was given to policy development processes (often donor driven or supported), and little to implementation, monitoring and evaluation of these policy initiatives (Lotz-Sisitka, 2005).

According to Mtaita (2007), many countries have developed comprehensive national strategies for integration of EE in formal school curriculum. The curriculum might be a form of statement of what EE means. This is what is referred to as the

'intended' curriculum while the operational curriculum, on the other hand, is what happens in the classroom. However, Cohen and Ball (1990), explain that the policy or curriculum statements vary in their effectiveness. According to Lotz-Sisitka (2005) the focus for EE appeared to be somewhat unclear in policy processes as it was often with the complexity of EE, the implementation in schools was open to multiple interpretations. Cohen and Ball (1990) showed that the policy can be interpreted and enacted in a variety of ways. They noted that while policy might have influence on practice, the practice also had a profound influence on the new policy. Hence when teachers implement the policy, they do so i terms of their pre-existing practice, knowledge, and beliefs. They can frame the policy in terms of what they already know, believe, and do in classrooms (Cohen & Ball, 1990).

Palmer (1998) noted a gap between intended or mandated and interpret EE. According to her the intended EE may not be effectively implemented. This study attempts to explore the differences between the intended and interpreted EE in the curriculum. The policy on teaching EE maybe at varianc with what actually happens in the classroom. The reason may be that although teachers have been asked to implement changes, they have not been offered support (Cohen & Ball, 1990).

2.6.1 EE Methods and Processes

Most EE teaching texts and manuals advocate for an experiential and participative pedagogy. How this is interpreted in practice differs depending on the dominant EE form (Rao and Reddy, 1996). Much debate in EE has therefore focused on discussing the methods and pedagogies that support EE *for* the environment. Fien (1993) asserts "...that '*about'* and '*through*' the environment are valuable only in so far as they are used to provide skills and knowledge t support the transformative intentions of '*for*' the environment". With this background, it is education *for* the environment that seems to have the potential of contributing most to the general well being of environment and the teaching methods tend to be linked to education *for* the environment.

Sytnik *et al,* (1985) share Fien (1993) view on using methods that promote education for the environment but further observe that EE should be oriented towards the solution of problems (problem-solving approach) and be concerned with opportunities for action (action-oriented approach). EE teaching/learning is

meaningful only when the acquired knowledge and skills are helpful in dealing with real life situations. According to Le Roux ...

> "Environmental issues are complex and multi-faceted. In light of this complexity, there is need to use a balance of EE ocesses in, about and for the environment. The challenge is to pro ide a range of learning opportunities for encounter, dialogue and eflection in diverse settings as we respond to a wide range of different environmental issues and risks through education. A su table mix of methods would seem useful together with a better understanding of the ideas which inform and influence our use of these ethods in different situations (Le Roux, 2001: 85)."

Teaching methodologies employed in EE must be responsi e to the needs of a particular discipline. They should take into account the nature of the discipline itself, type and level of teaching objectives, learner charact istics, psychology of learning and teaching processes, and the resources available (L Roux, 2001). The ultimate criteria of effectiveness of teaching methodologies refer to the extent of success in realising the stipulated objectives. It is now an established fact that the same objectives can be achieved through more than one teaching methodology. The complexity of EE not only creates challenges in its interpretation but also in the way it is approached (Mtaita, 2007). The views expressed above on teaching EE vary according to the author's experiences. However, the be approach to teaching EE is to adopt the methods that embrace the goals, objectives and principles of EE.

2.6.2 Strategies of Integrating EE in the Curriculum

EE is, at its heart, an integrative undertaking (Gough, 2009). The European Commission (2009) identifies three strategies for infusing EE in the c rriculum;

a. EE as a separate subject in its own right
b. EE embedded in specific subjects of the curriculum
c. EE as topics or themes in the curriculum that are addr ed in an interdisciplinary manner (thematically oriented approa h)

It is important to note that in many other areas of the curriculum, EE is not necessarily taught as a separate subject and indeed it has been recommended that it should not be taught on this basis (UNESCO 1985; European Commission, 2009; Powers, 1996; Mtaita, 2007; Gough, 2009). However, the implication of this approach is that curriculum documents do not necessarily prescribe the E content and there is flexibility in terms of the extent to which it is covered (European

Commission, 2009). The extent of teaching EE depends on the personality of the teacher. A similar observation is: 'Even where local authority policies are in place, provisions in school remain patchy and heavily reliant on the interest and the will of the small number of committed teachers' (Nixion *et al.*, 1999 in European Commission, 2009).

However, UNESCO (1986) points out that there is no universal model for the incorporation of EE into educational processes. The approaches, procedures and progressive stages of integration must be laid down in the light of the specific conditions, ultimate aims and educational and socio-economic structures of each country. Oduro-Mensah (1992) observed that more and more content has been added into the existing school curriculum to the extent that there se to be no more adequate room for additional content. In view of this, it may not be possible to teach EE as a separate subject in formal institutions as it would pu further stress on the already 'suffocating' curricula. This means that much nnot be achieved in formal education set up in the area of EE unless there are major curricular innovations. It is recommended that EE be taught alongside existing subje this will also give the teaching of EE a true integration approach. According o Le Roux (2001) the inclusion of EE across the curriculum rather than as a special subject on its own means that educators in all learning areas can draw on 'environment,' that is, both local and broader environmental issues as a basis for eir teaching.

From the statements above, it can be concluded that mo t of the literature favour the infusion model of integrating EE in the curriculum over diffusion. In the infusion model the environmental concepts are integrated into e sting curricular of different subjects while in diffusion model EE can be introduced as a separate course in the curriculum (Panneerselvam & Ramakrishnan, 2005; Rao & R ddy, 1996; Otiende *et al*, 1996) However, Gough (2009) has observed that the EE research literature provides a recurring testimony to lack of success in introducing coherent or consistent programmes in teacher education courses. Could the infusion model of integrating EE into the teacher education curriculum be responsible for this testimony in literature? There is need to investigate this gap.

2.6.3 Barriers to Incorporating EE in Teacher Education

From a survey of teacher training situation in Africa, Sytnik *et al*, (1985) cited the following problems in incorporating EE into the teache training colleges; a lack of appreciation of the importance of EE; compartmentalisation ucture in institutions of higher education; a shortage of adequately trained teacher educators; too little schedule time in crowded programmes; insufficient EE materials for use; inadequate opportunities for field studies and lack of funds. These challenges are also shared by several scholars (Gough, 2009; Beckford, 2008; Mtaita, Powers, 2004; Kinyua & Murungi, 2002; Pandya, 2000; Jones, 1996).

Currently, the position of EE still remains precarious as there is still no specific way in which it is taught. Namafe (2008), observed that the position of EE in the colleges was precarious because of expectations that, as a cross cutting issue, every study area should teach it in some form or the other. Moreover, Namafe, (*ibid*) further noted that there seemed not to be a definitive way to ensure that EE was taught as expected. The observations above indicated that challenges facing the incorporation of EE in Zambian colleges of education have not been resolved, if anything, they have increased with time.

Sauve in Beckford (2008) has also stated that there is very little consensus on how EE should be taught. A major difficulty in incorporating EE into teacher education programmes was the lack of shared understanding of what EE is. This view was also shared by Pandya (2000) and Gough (2009).

According to Beckford (2008) EE is sometimes thought of as being synonymous with Outdoor Education, Nature Studies, and Environmental Science. Moreover, EE has long been categorised as a scientific discipline which to some scholars, is limiting. The truth is that EE is a complex and still evolving field (Sauve in Beckford, 2008). EE concepts and knowledge are often "caught" rather than taught. It can be deduced that EE continues to exist at the fringe of teacher education even at present time.

UNESCO (1985) also noted that most countries have deficiencies in teacher training programmes. The research finding states that the majority of the training programmes appear to be theoretical and abstract. This is worrying as the training appears to be incompatible with incorporating modern methods suitable f r EE, such

as problem solving, practical experience and active pa ticipation of teachers and students in the learning process. However, the curriculum in colleges of education emphasise learner centred approaches of teaching (MoE, 1996). This is compatible with the principles of EE. In researcher's view, this makes it easy for the infusion of EE in the curriculum as the educational curriculum ties well with EE principles and goals.

2.7 Training Teacher Educators in EE

Environmental training of qualified educational personn has been considered as a 'priority activity' (Sytnik *et al*, 1985). This could be due to a large number of teachers who graduated at a time when issues of EE were not given due attention (Agrawal & Aggarwal, 1996). With this background, UNESCO (1978) emphasised that teachers have long been identified as the major target r EE. The Belgrade Charter (1975) and recommendations 17 and 18 from the 1977 Tbilisi Conference on EE called for teacher education to include EE. According to UNESCO in Gough (2009: 8) "all teachers need to understand the importance of environmental emphasis in their teaching and so Environmental Science and EE need to be included in the curricular for pre-service teacher education and that the necessary steps are taken o make in-service training of teachers in EE available for all those who need it."

EE requires special training and commitment because it needs a different focus and outlook that many prospective teachers have not experienced in their own education (Tilbury, 1997). Agrawal and Aggarwal (1996) pointed out that a number of effective EE teacher training programmes in the world far below an acceptable level. In Zambia, this can be attested by the University of Zambia being the only institution in the country offering postgraduate and undergraduate programmes in EE. However, the National In-service Teachers' College (NISTCOL) used to offer in-service module in PTDDL in EE to Primary school teachers but it has since been discontinued. Currently, EE is just one of the topics in module seven – crosscutting issues module. This inclusion of EE as just a topic or as one time module was also observed by Pandya (2000) in India and Powers (2004) in the USA. However, some teacher education programmes offering natural and social sciences tend to have environmental topics embedded in them.

The Zambian government's need for support to develop a comprehensive EE programme was initiated by the development of Zambia Education Programme Training of Trainers Certificate Course in EE by WWF (Muwowo *et al*, 2005). The programme was one of the most formalised organisations working with government institutions to foster the implementation of EE in the country. The course supports all the three components; teacher training, materials development and community EE (Muwowo *et al*, 2005). This programme has since been stopped and not all college teacher educators were trained and this poses a challenge to the teacher educators who have to teach EE without any training in it.

2.8 EE Training Programmes

UNESCO-UNEP (1990) cites competencies in foundational professional education and EE content as desirable in teachers involved in EE implementation. Moreover, Agrawal and Aggarwal (1996) spread these two competencies desirable in teachers into professional education, ecology, conceptual environmental awareness, environmental issue investigation and evaluation, and nvironmental action skills. It is in these areas that teacher educators should be trained if they have to be competent to teach EE.

2.9 Past Studies on Environmental Education in Teacher Education

This section examines literature on EE in teacher education from international and local sources. A relatively large portion of literatur on EE arises from outside Zambia while a small volume is locally based. A small volume of locally based literature has been reviewed due to the point that EE was a new field (Namafe, 2006) and it attracts little attention among the researchers in the country. It should be pointed out that the literature does not explicitly di cuss the perception of EE and participation of teacher educators in teaching it but covers features of EE in teacher education.

2.9.1 Literature from Outside Zambia

The literature reviewed on EE in teacher education out Zambia is from Canada, India, Kenya, Tanzania, and Botswana.

2.9.1.1 A Case Study of EE in Canada

Beckford (2008) carried out a study on re-orienting EE in teacher education programmes in Ontario Canada. According to him, it...

> "...seems fair to say that the teacher education goals set out in international agreements, such as the Tbilisi Declaration or the UNESCO global initiatives on reorienting teacher education towards sustainability, are yet to be recognised in the provin e's education policies. The dearth of teacher education programs in E results in a teaching force that lacks the necessary competencies to effectively address the aims and goals of EE. In fact, only a limited number of teacher education institutions in Ontario offer EE courses for prospective teachers. Many teacher institutions seem t view EE as a further burden to the existing pressures of the already demanding teacher education. EE is not treated as a priority in Ontario and is often treated as a single topic in a core education course. tends to be a small component in science, geography, and social studies units. There is a lack of understanding amongst teachers of the interconnectedness of environmental issues, society, economy, politics, a d the implication for EE arises. The current approaches to EE can have a minimal impact on improving environmental literacy, but do not provide the knowledge, skills and experiences that are required to develop requisite competencies in EE. EE research in p e-service teacher education programs is rare in Canada. EE is a rrowly perceived domain of knowledge and awareness of environmental issues and concerns with little attention to socio-economic, socio-cultural and political context and dynamics and EE courses are taught predominantly by science specialists rather than environmental educators where the major emphasis is on scientific ecological principles and concept. There is a definite lack of co erency and comprehensiveness about the approaches taken. EE has existed at the margin of most pre-service teacher education programs with little prospect of significant EE implementation. It is rarely included into the core teacher education curriculum and, rather, ten consist of bits and pieces of unconnected ideas (Beckford, 2008:18)."

Russell, Bell, and Fawcett in Beckford (2008) explained that where EE is taught in schools, it is due to the effort of one or two dedicated teachers. The research taken showed that there is lack of awareness, commitment, an interest of teacher education institutions in EE programming. Moreover, EE suffers from a certain degree of distrust and a general lack of academic respectability among faculty members. Additionally, finding time to include EE is a major issue for faculties of education that are already overloaded and up against other new courses being proposed.

Report of the working group on environmental education in Beckford (2008) in Canada explains that many teachers lack competencies to effectively teach EE, a problem attributed to the fact that few faculties of e ucation prepare teacher candidates adequately in this area. In the absence of specialised teacher training and

expertise, there is likely to be a gap between the EE 'intended' in Ontario's curriculum and that which is taught and received in the classroom. The working group on EE also observed that the lack of professional development in EE coupled with the limited opportunities for EE in pre-service education means that there are very few teachers with specialised EE expertise. It should therefore, be noted that teachers are generally innovative and self-motivated, and many of them effectively develop expertise teaching on the job.

2.9.1.2 A Case Study of EE in India

India is one of the very few countries in the world where a commitment to environmental protection and improvement is enshrined the constitution. Pandya (2000) in her research on teacher education for EE in India observed that there was lack of adequate pre-service training in EE and consensus on what should be the scope and content of EE at various levels of pre-service training programmes. A major concern was the notion that EE should be perceived as mere introduction of environmental concepts and facts. She observed that while "environment" as subject has been incorporated in one way or another in most school curricula, training in EE has not yet been infused into the curricula of teacher training courses. Thus, teachers are not well equipped to deal with the new subject area and where EE has been introduced as an optional or elective subject into teacher training courses, it was not perceived to be in the same way as is in other subjects such as Educational Technology, Multimedia Education, and Computer Educati n. Pandya (2000) also discovered that EE was generally perceived as having heavy natural science content and, hence, was not chosen by "non-science" teachers who feel they may be unable to grasp it. In-service training is usually a one-time module. Pandya (ibid) further observed that lack of resources and support from institutional managements and other crucial agencies also restricted the access of teachers to training, opportunities, resources and reference material and ongoing support in implementing EE methodologies and activities in their course of work.

2.9.1.3 A Case Study of EE in Kenya

Kinyua and Murungi (2002) carried a research in Kenya to explore factors impeding the development of evaluation in Africa with special r ence to policy and practice – a case study of EE curriculum in Kenya. A descriptive design and content analysis

were used in describing of the status of EE in primary teacher training programme. Data was obtained by means of questionnaires, interview guides, observation schedules and content analysis of the various syllabuses and corresponding teacher's guides.

Kinyua and Murungi (2002) observed that the majority of the tutors had not attended any form of in-service training in EE. Moreover, there was a huge problem in integrating EE program in that it lacks well-implemented in-service training programmes for tutors. The four disciplines of Agriculture, Science, Home science and GHC have incorporated topics on EE and that emphasis placed on these topics as indicated time allocated to them is enormous. However, the syllabi did not guide the tutors on the methodology and resources. The methodology/techniques used in teaching environmental education were ineffective in creating awareness and attitude change to achieve permanent behaviour changes. The tutors were unable to use effective techniques due to congested curriculum, lack of awareness and exposure, lack of tutor guides, large classes and lack of learning resources.

Against this background, one could conclude that the implementation of the integrated EE in the primary teacher education was not very effective due to a number of constraints particularly in relation to inputs. Theref re, as it is, EE was unlikely for it to achieve the projected impact of achieving environmental awareness through the normal educational channel.

2.9.1.4 A Case Study of EE in Tanzania

Mtaita (2007) conducted a research to explore stakeholders' views f involvement and participation in EE in Tanzania in 2007. The study adopted an interpretive methodology framework and purposeful sampling strategy was used. The methods used for data collection included semi-structured interviews with teachers, school leaders, government, and EE agency officials and open-ended questionnaires with students and parents. Data analysis followed qualitative and quantitative procedures.

The findings of this study indicated that the views and teaching of EE amongst participants was limited to education *about* the environment. Little emphasis was given to education *in* and *for* the environment. The challenges with respect to the implementation of EE were noted to be limited time and resources, and lack of training and funds. The above account implies that EE is perceived to be creation of

awareness, knowledge and understanding and that EE is challenging field to implement.

2.9.1.5 A Case Study of EE in Botswana

Ketlhoillwe (2003) in his study which addressed the status of EE in Botswana revealed that teachers did not have training in EE during their training at college. He also observed a negative attitude by teachers towards its activities, as it was not timetabled and examinable. Teachers felt discouraged to teach it which in the end was not examinable. EE was looked at as an additional burden and not a necessity in the curriculum. The existing curriculum was too theoretical to infuse a practical subject such as EE.

2.9.2 Literature from Zambia on EE

Mweembe, (n.d.) outlined that EE existed as an extra curricular activity in the school curriculum being well pronounced under the *chongololo* and conservations clubs. In curricular activities, EE existed only in Environmental Science, Social Studies and Geography prior to the curriculum review of 1993 that de an attempt to integrate EE as a concept across the curriculum. According to Mweembe, (n.d.) the EE which have been integrated into the school system do not only develop 'hands on' EE experiences, but also have been contextualised towards the needs of the learners.

Mweembe (*ibid*) explained that the integration of EE in the Zambian education curriculum has been achieved through the infusion model approach. There are several reasons why the infusion model has been preferred. Teachers are already burdened with overloaded curriculum which provides little opportunity to add a separate subject. There was limited time and resources available, hence, the infusion model would enhance the existing curriculum without competing for time and resources. This view is shared by many authors (Beckford, 2008; E opean Commission, 2008; Gough, 2009; Rao & Readdy, 1996). This means that all learning areas can draw on the environment at local and global levels (CDC, 2000b; Mweembe, n.d.).

CDC (2000b) states that the curriculum recognises the primacy of literacy, numeracy and a number of crosscutting themes which have been identified as central to the future development of Zambia. According to MoE (2001), the cross-curricular issues and themes identified in the Ministry of Education Pol Educating Our Future as

being critical to the future development of Zambia are Health (in particular HIV/AIDS), Reproductive health, Transmission of Zambia's heritage, Environment, water and sanitation, Life skills and Gender in education. Analysis of these crosscutting issues included in teacher education curr culum in the view of the researcher, all fall under EE. Health (HIV/AIDS), reproductive health, transmission of Zambia's heritage, life skills and gender are social issues of the environment. No wonder the current educational policy 'Educating our f ure' does not emphasise the status of EE in the curriculum but rather emphasises H alth education, and Environmental health which are social component of EE (CDC, *ibid*).

In the researcher's view, the isolation of environment from other components of EE could make EE be seen to be concentrating on nature conservation. According to him

> "...the controversial nature of EE has discouraged Schools of Education from teaching EE in an integrated fashion an has led to the development of "selective curriculum" where only certain methods and knowledge are taught. As a result, some undergradu e teacher preparation courses intentionally avoid linking with o her controversial areas of study and omit consideration of the political, economic, ideological and cultural perspectives. The holistic teaching of environment and development issues is viewed as a c ntroversial and political issue for Schools of Education and they ften play it safe with a generic environmental studies or science course (Jones 1996)."

The narrow emphasis of EE in educational policy may influence the perception of EE by the teacher educators to view EE as ecological or physical aspect of t e environment. This may lead EE to being associated to science (Gough, 2009; Beckford, 2009, Jones, 1996; UNESCO, 1985). There is urgent need to view environment in its totality as stipulated in the principles of EE.

Environment is a subjective term and its wide interpre ation will result in a diverse EE depending on the individual lecturer or college. This eaves room for omission or inclusion in lessons by prospective teacher educators epending on their expertise or interest in the subject. This is in line with Mckeown in Mastrilli (2005:7) who explained that ''because EE is not institutionalised its presence in the curriculu is at the mercy of the teacher. This leaves EE in a precarious position". With all this 'confusion' surrounding EE in teacher education, the situation is not made any better as there are no other supporting guidelines to enhance the implementation of teaching EE as a crosscutting issue.

2.10 Summary

The literature review indicates that EE was a new and volving field. Being a new field, it has not only created challenges in its inter retation but also in the way it has been approached and practised. Although there is no universal model for the incorporation of EE into educational processes, there appears to be a consensus in the field of EE that environmental topics are best taught using the infusion model than diffusion model. Literature from both developed and developing countries suggest unsuccessful integration of EE in teacher education and ineffecti participation of teacher educators in EE. According to the available literature, challenges to effective integration of EE in teacher education are due to overloaded curriculum, lack of knowledge and skills in EE, lack of time and funds, insufficient EE materials for use, little consensus on how EE shoul be taught and what EE is.

In the view of the researcher, the perceptions of EE by teacher educators have a direct impact on how EE will be taught. This area of EE has not yet been explored in primary teacher education institutions in Zambia. As a result, this study will attempt to fill in the knowledge gap that existed at the time this study at KCE and MACE regarding the teacher educator's perceptions of EE and, their participation in its teaching in these two colleges of education

The next chapter describes the research methodology us the study to answer the four research questions, which the study posed earlier.

Chapter Three

Methodology

3.0 Introduction

This chapter describes the research methodology that was used in the collection and analysis of data. In addition, the chapter discusses the credibility of the data collected and limitations of the study.

3.1 Research Design

The study employed a case study research design and followed both qualitative and quantitative research approaches. A basic case study entails the detailed and analysis of a single case (Bryman, 2004). This study focused only on EE, one of the seven crosscutting issues integrated in the curriculum of the two colleges. The strengths of including some qualitative paradigm aspects are that it studies people in terms of their own definitions of the world and focuses on the ubjectivity experiences of individuals and its sensitiveness to the contexts in which people interact with each other (Mouton, 2008). Moreover, quantitative approach as infused in to compare the respondents' perceptions of EE and participation as outlined in Kombo and Tromp (2006). The study attempted to understand college teacher educators in terms of their own perception of EE and how they teach it fr the subjective perspective of the individuals involved. The focus is on an insider-perspective rather than on an outsider-perspective.

3.2 Context of Study

The study was carried out at Kitwe and Mansa Colleges of Education which are situated on the Copperbelt and in Luapula provinces of Zambia respectively. These provinces were purposively selected as they have a record of high levels of environmental issues (ECZ, 2000). Secondly, the selection of colleges of education was restricted to available funds and the researcher planned to take full advantage of the limited time scheduled for data collection.

3.3 Study Population

The study population comprised all college teacher educators at KCE and MACE. The population of teacher educators in these two colleges was 79. KCE offered

primary teacher's certificate to its students while MACE offered primary teacher's diploma.

3.4 Sampling

It is a process of selecting a number of individuals or objects from a population such that the selected group contains elements representati e of the characteristics found in the entire group (Kombo and Tromp, 2006).

3.4.1 Sampling Technique

Purposive sampling was used to select both colleges and respondents. According to Kombo and Tromp, (2006) purposive sampling is used when a specific characteristic is to be studied in-depth. Within the two colleges of education, the Head of Sections (HoS) and lecturers from contributory subjects within each s dy area were also purposively selected to participate in the study.

3.4.2 Sample Size

The sample size comprised 33 respondents. The sample size of respondents used in the study was in line with Mouton (2008) recommendation of less than 50 respondents for case studies. The distribution of the respondents in each college is tabulated in Table 3.1.

Table 3.1: Distribution of Respondents in the Sample

College of Education	Teacher educators		Total
	Lecturers	HoS	
Kitwe	11	7	**18**
Mansa	09	6	**15**
Total	**20**	**13**	**33**

Source: Field data (2010)

Kitwe College of Education had more respondents who pa ticipated in the study than Mansa College of Education as KCE had twice the number of teacher educators than MACE.

3.5 Research Instruments

To generate data for this study, questionnaires, structured observation, focus group interview guides were used in the two colleges. Table 3.2 on shows the participants and their nature of involvement in the study.

Table 3.2: Participants and Their Nature of Involvement in the Study

Participants	Total number	Methods of data collection			
		Lesson observation	Questionnaires	Content analysis	FGD
Lecturers	20	**P**	**P**	**P**	**P**
HoS	13		**P**		**P**
Totals	**33**	**10**	**33**	**20**	**33**

P - Showing participants in the study. ***Source: Field data (2010)***

From table 3.2 it can be seen that HoS only participat in FGDs and filling questionnaires while lecturers participated in lesson ervations, questionnaires filling and provided documents for content analysis.

3.5.1 Questionnaires

Questionnaires (Appendix A) were used to collect data on the views and challenges encountered in teaching EE, the degree of participation of college teacher educators and their training needs in EE. The questionnaires contained both open and closed ended questions. Open-ended questions provided the opportunity for the respo ents to qualify their answers and, thus gave this study a more adequate indication of how they interpreted the questions. The questionnaires generated the college profiles relating to EE practice. Questionnaires (Appendix A) were personally distribute the researcher to the identified participants after br them about the purpose of the study. A total of 40 questionnaires (that is, 20 questionnaires per college) were distributed to the participants and 33 were returned. The return rate of the questionnaires was 83 per cent.

3.5.2 Observation Guide

Observation guide was used to collect data on teaching in the classroom in order to determine whether what the respondents claimed in the questionnaire were matching with their actual classroom practice or not. Structured observations were used to gather data on how college teacher educators' participated in EE in their

respective study areas. According to Kombo and Tromp (2006) during structured observations, the focus is on a small number of specific behavioural patterns and only those appearing on pre-determined observation guide are recorded. The researcher observed the implementation of lessons by 10 college teacher educators at KCE as these were willing to be observed. However, at ACE, teacher educators were not observed due to extended closure of college to facilitate training of census supervisors and enumerators. In order to guide the lesson observations, an observation guide (Appendix B) was used. The same teacher educators who responded to the questionnaires, participated in FGDs re observed teaching in the classroom. The observations in the study focused on whether or not EE was integrated in the study area lessons.

3.5.3 Focus Group Discussion Guide

Focus group discussion (FGD) guide (Appendix C) was used to collect and clarify views of college teacher educators and challenges encountered in teaching EE as a crosscutting issue in the two colleges. Through FGD, college teacher educators created their own structure and meaning of EE as a crosscutting issue. It was also a source of validation for data collected through the qu tionnaires (www.evalued.bcu.ac.uk/tutorial/problem). In each of the two colleges, the FGD consisted of two groups of similar participants (lecturers and HoS). Groups with similar participants were formed to ensure that respondents felt comfortable with each other and fully participated in the discussion (Kombo and Tromp, 2006).

Four FGDs were held and facilitated by the researcher. In each of the participating college, two FGDs were held separately for lecturers and HoS. Eight lecturers and six HoS participated in the discussions at KCE while a MACE, seven lecturers and six HoS participated in the group discussions. Each FGD lasted for an average of 35 minutes. A common schedule for operationalising the focus groups was used towards the understanding and participation of college teacher educators in teaching EE as shown in Appendix C. The FGDs were put on the audio recorder and later transcribed as verbatim transcript (Appendix D). In the verbatim transcript the respondents were denoted by study areas (LLE, ES, ME, , SSME, EA, TS) and subjects (PE, HE, IA, A & D) to protect their identity.

3.5.4 Content Analysis

Although content analysis is not a research instrument, the researcher found it valuable in collecting data on college teacher educator's participation in EE, hence its inclusion. Content analysis is defined as a strict and systematic set of procedures for the rigorous analysis, examination and verification of the contents of written data (Cohen *et al*, 2007). The documents that were analysed included the syllabi and teaching file for college teacher educators. The teaching files comprised schemes of work, records of work and lecture plans or notes. Formats of the schemes of work, record of work and lecturer plans are attached as Appendix E. These documents acted as evidence to the college teacher educators' participation in teaching EE. Furthermore, students' note books from the two colleges were also examined to assess the level of teacher educators' participation since books show records for students' activities done in class. The focus of content analysis was on whether or not environmental issues were planned for in the study areas and to identify the methods used in EE.

3.5.4.1 Teaching Files

The respondents' teaching files (10 from KCE and 7 from MACE) that contained the schemes of work, and curriculum coverage (record of work and lecture notes) were studied critically. The teaching files dealt with work covered by respondents and their reflections, while lecture notes revealed learning outcomes and learning activities covered (See Appendix E). The focus of the researcher was on topics covered, methods of teaching employed, learning outcomes, and students' learning activities as they revealed the level and nature of the respondents' participation in teaching EE. The results of teaching files' analysis are presented on page 61 of this report.

3.5.4.2 Students' Note Books

A total of 35 students' personal note books were studied critically (that is, five books per study area). At MACE, 14 note books were obtained rom 11 students who remained to work in the college during the extended th rd term holiday. The remaining 21 note books for content analysis were provided by seven students from KCE. Note books were only collected from students taught by participants involved in the study. The findings from the note books are reported on page 61 of this report.

3.6 Data Collection

Data collection involved stating the sources of inform on and the process of collecting data.

3.6.1 Sources of Information

Both primary and secondary data sources were used. Secondary data sources included internet and literature reviews while primary data sources consisted of data collected through questionnaires, observation lessons, and focus group discussions. Secondary sources are those that do not bear a direct physical relationship to the event being studied, they may include quoted materials or interpretations of events based on primary sources (Cohen *et al,* 2007). It is important to note that there was scant literature on EE in Zambia as it was a new field (Phiri, 2008). Therefore, most of the secondary data was obtained from the internet, but the syllabi, schemes of work, lesson plans, and students' notes books also provided useful information.

3.6.2 Process of Data Collection

Questionnaires, observation guide and FGD guide were piloted to ascertain their reliability and validity at Nkana College of Education in Kitwe from 19th to 23th July 2010 before they were used in the study. These instruments were piloted on three HoS and four lecturers. The essence of having the pilot was to make the instruments clear and easy to follow. The feedbacks from the pilot study made the researcher modify and revise the instruments through re-wording some questions, clarify the instructions and made changes to the layout of the questionnaire. Data was collected from Kitwe between 26th July and 28th August 2010 and lastly from Mansa College of Education between 20th September and 1st October 2010.

3.7 Data Analysis

Both qualitative and quantitative data was collected for analysis in this study.

3.7.1 Qualitative Data

Views of college teacher educators on teaching EE and how it was taught as a crosscutting issue were analysed using thematic approach. Responses for open-ended questions from the questionnaires and focus group discussions formed the data for qualitative data analysis. The open-ended questions were analysed on the basis of the three-step process for data analysis; data reduction, data display and drawing

conclusions or verifications. Codes were generated from the data and simple frequency counts helped to identify the pattern or themes.

3.7.2 Quantitative Data

Quantitative data was obtained from the close-ended questions in the questionnaires and coded qualitative data from open-ended questions and focus group discussions. The degree of college teacher educators' participation, approaches used in the teaching of EE, and the training needs of teacher educators in EE were analysed using SPSS version 16 a computer software. The analysed data was presented in form of frequency tables, percentages, and graphs in Chapter Four.

3.8 Validity and Reliability

According to Cohen *et al* (2000), reliability is about consistency of the results obtained from a measuring instrument in a piece of res rch while validity refers to whether a measuring instrument measures what it is sup sed to measure, or the degree to which the finding is interpreted in a correct way. To ensure tha this study produced realistic, valid and reliable results, triangulation method was used. This study used various data collection techniques such as questi aires, observation and focus group discussions. The data collected from different methods was cr ss checked for credibility. Furthermore, instruments (i.e. questionnaires, observation schedule and FGD guides) used for data collecting were piloted (Cohen *et al*, 2000). The researcher also avoided asking leading questions to the respondents during focus group discussions and in the questionnaire. Lastly, ho ding separate FGDs for lecturers and HoS, enabled the respondents feel comfor to respond freely to the questions and this also increased the validity of the results.

3.9 Limitations

The study required few college teacher educators to ex ss their view on EE and their participation in its teaching in colleges. Respondents were derived from two colleges which were purposively sampled as such findings may be limited to this case. In addition, the researcher experienced some dif lties in meeting all purposively selected teacher educators for focus group discussions and lessons observations. This was due to the fact that some parti ipants claimed to be committed to either personal programmes or other college duties in addition to their routine of teaching. The extended closure of colleges f education in the third term

from 14th September to 19th October 2010 also affected lesson observation at MACE. Lastly, the researcher also had limited money to use i this study while the study needed a lot of money to cover lodging cost, stationer and transport to and from Kitwe and Mansa.

3.10 Ethical Concerns

The respondents in each college of education were cont ted and permission was sought from them and college administration to participate in the research. Therefore, informed consent was requested from the par cipants as the researcher fully explained to the respondents the essence of the research before embarking on any activity. Participants remained anonymous because e researcher used pseudo names in data analysis and presentation, thereby enhancing confidentiality. Moreover, only respondents who freely agreed to be observed teaching in the classroom were seen. This respected the participant's o decline.

Chapter Four

Presentation of Results

4.0 Introduction

This chapter presents the data collected through questionnaires, focus group interviews, structured observations, and content analysis on teacher educators' perceptions of EE and their participation in its teaching in Zambia's Primary Colleges of Education. The findings are presented according to the research questions;

- What are the views of teacher educators on the teaching of EE as a crosscutting issue in Colleges of Education?
- How do teacher educators participate in teaching EE as a crosscutting issue in Colleges of Education?
- How effective is the crosscutting issue approach used by teacher educators in the teaching EE in colleges of education?
- What are the training needs of college teacher educators in EE?

In presenting data, headings were used and each heading covered a certain aspect of the study. During the presentation of the findings, quotes from focus group discussion were used in order to clarify certain points that required highlighting. Graphs and tables were used to indicate how one category response compar d to other category responses concerning each question the study investigated.

4.1 The Respondents

As stated in chapter three under methodology, responde ts in this study comprised college teacher educators (Lecturers and Heads of Sect s) from KCE and MACE. The number of the respondents and contributing subjects they teach within the seven study areas are shown in Table 4.1 on the next page.

Table 4.1: Distribution of Respondents among the Teaching Subjects within each Study Area

Study Area	Teaching contributory subject	KCE		MACE		Total
		Female	Male	Female	Male	
Education studies	ES	2	-	-	2	**4**
Literacy and Languages	English Language and Zambian Languages	-	1	1	2	**4**
Mathematics Education	Mathematics Education	1	1	-	2	**4**
Science Education	Science Education	-	2	-	2	**4**
SSME	SSME	2	1	-	1	**4**
Expressive arts	Art and design	-	2	-	1	**3**
	Music	-	1	-	1	**2**
	Physical Education	1	-	-	1	**2**
Technology studies	Home Economics	2	-	1	-	**3**
	Industrial Arts	-	1	-	2	**3**
Total		**8**	**9**	**2**	**14**	**33**

Source: Field Data (2010)

Table 4.1 shows that all contributory subjects in the seven study areas had respondents who participated in the study. Subsequent analysis of Table 4.1 reveals that EA and TS study areas had separate lecturers that taught contributory subjects while ES, LLE, ME, SE and SSME study areas were taught by one lecturer. Overall 30.3 percent of the participants were females while male participants accounted for 69.7 percent.

4.1.1 Lecturers

A total of 20 lecturers participated in the study, 11 KCE and nine from MACE. Lecturers accounted for 61 percent of the respondents in the study. Their teaching experience in colleges of education and professional qualifications are tabulated in Table 4.2 on the next page.

Table 4.2: Characteristics of College Lecturers

Attribute		KCE		MACE		Total
		Female	Male	Female	Male	
Number and Gender of participants		4	7	1	8	**20**
Highest qualifications of participants	Diploma	-	4	-	-	**4**
	Bachelors' degree	4	3	1	8	**16**
Work experience in College	Less than 5 years	-	-	1	3	**4**
	5 – 10 years	1	4	-	4	**9**
	More than 10 years	3	3	-	1	**7**

Source: Field Data (2010)

Table 4.2 reveals that five female and 15 male lecture s participated in the study and their qualifications varied from a diploma to Bachelor s degree in Education. KCE had four participants with diplomas as their highest q fication but they had more than five years teaching experience in the college. Analysis of Table 4.1 also reveals that the majority (15) of respondents were males.

4.1.2 Heads of Section

As mentioned above, there were seven study areas in th two institutions and each managed by the HoS. Table 4.3 below features respondents' highest qualifications and their work experience.

Table 4.3: Characteristics of Heads of Section

Attributes		KCE		MACE		Total
		Female	Male	Female	Male	
Gender and number of participants		4	3	1	5	**13**
Highest professional qualifications of participants	Bachelors' degree	2	3	-	5	**10**
	Masters' degree	2	-	1	-	**3**
Work experience in colleges	Less than 5 years	1	-	-	1	**2**
	5 – 10 years	1	2	-	2	**5**
	More than 10 years	2	1	1	2	**6**

Source: Field data (2010)

Table 4.3 shows that 13 Heads of sections (five female and eight males) participated in the study. Their highest qualifications ranged from Bachelors' Degree to Masters

Degree in Education. The results further revealed that three females had the highest qualification (Master's Degree in Education) while the rest (10) had bachelor's degree in education. However, the majority (eight) of S who participated in the study were males.

4.2 Views of College Teacher Educators on Teaching EE

One of the four research questions of the study sought to determine the views of teacher educators on the teaching of EE in Primary Colleges of Education. Results on this aspect are reported below.

4.2.1. Understanding of EE by the Respondents

Four themes emerged from the questionnaires (Appendix and focus group discussions (Appendix C) on college teacher educators' understandings of what EE was. These themes are featured in Table 4.5 below.

Table 4.4: Teacher Educators' Views of EE

Themes	Frequency	Percentage (%)
• Creating awareness about the environment;	27	82
• Teaching/learning about change of attitudes towards the environment;	2	6
• Study about the environment and how to take responsibility of the environment	3	9
• Acquisition of knowledge, skills, values and attitudes needed to care for environment	1	3
TOTALS	33	100

Source: Field data (2010)

Table 4.4 reveals that EE was interpreted differently those who were supposed to teach it. The majority (82 per cent) of the respondents viewed EE as creating awareness about the environment. Only nine percent of he respondents viewed EE as the study of the environment while three percent of the respondents viewed EE in terms of acquisition of knowledge, skills, values and ttitudes needed to care for the environment. It was interesting to note that the views given by the respondents fall in the five objectives of EE as formulated by the Tbilisi conference embracing awareness, knowledge, attitudes, skills, and to some extent participation. Further analysis of Table 4.4 and quotations from focus group scussions indicates that

respondents' interpretation of EE in terms of natural or ecological component of E and not in totality as outlined in the principles of EE in Chapter Two.

4.2.2 The Position of EE in the Two Colleges

Various views emerged on the status of EE in the two colleges from the questionnaires (Appendix A) and FGDs (Appendix C). The narrative below reflect the thoughts and feelings of respondents on teaching E as a crosscutting issue. Teacher educators from KCE were quoted on the status of EE in the college as saying...

> *"It is in all study areas as a crosscutting issue and it also exists as a co-curricular activity. Er... say conservation club."*
>
> *"I would say it is not there, for I have not even seen the clubs and dissemination of environmental education in any study area...Like in my study area Expressive Arts...right it is a crosscutting issue but we do not teach it. Maybe because of lack of information on what is involv in EE."*
>
> *"Uh it is in all study areas and extra curriculum activities ... in PMS we encourage students to plant trees. So, silently it is in the college! But in SSME it exists as topics and we teach it to the students."*
>
> *"Yes in theory it is there like everyone has said except it is silent. In LLE we talk about, trees, soil and others. These words which we talk about are part of the environment. So it is there except it is very silent and with little impact on the lives of students."*
>
> *"We have it as a crosscutting issue as stipulated by the syllabus but it does not come out when we teach the educational topics. Usu lly we leave it out due to time. Probably...the syllabus has no topics or content that can be taught to students."*
>
> *"In mathematics, it does not come out in terms of cont nt as such but there is a component when we look at the aims and objectives of teaching mathematics, one of the aims is that the students should be able to apply the knowledge to everyday issues and one of the things we about is that students should appreciate the environment. But I should stress that this is just done in passing."*

Teacher educators from MACE were also quoted saying the following during FGD on the status of EE in their respective study areas;

> *"In ES we do not even mention it, and if it is, then it is accidental. It is not even included in the schemes of work as it is not in the syllabus."*

> *"In TS it is not mentioned as a component on its own but infused in other existing knowledge or topic, for example, how to dispose litter, vandalism, and the importance of having latrines. That is basically, ow it is taught but it does not come out as EE. It is just topics or scattered within the topics."*

> *"Currently in Mathematics, we are doing it on a very s scale usually when preparing questions on statistics. But we do not teach it as it does not have content in the syllabus."*

> *"In LLE, it is not a topic but just a component under a topic cross tting issues. So it is just a by the way issue and sometimes it is even skipped because it is not so important."*

> *"I can confess that we do not emphasis the teaching of EE in EA. If some lecturers are doing it, then I am not aware as EE is not i cluded on the scheme of work. In fact, even in the lecturers' teaching files I have not seen any thing to do with EE. At times we give students an assignment to draw a tree; if this is EE then we teach it."*

> *"In SE, it appears as a major topic and it is included in the syllabus and schemes of work. When you look at EE it is more inclined to Science than any other study area though it is a crosscutting issue. In other study areas it has not come out so clearly as in science though even in SSME, it is also clear. For us we go directly hammering on it as it app rs in the syllabus. But as a crosscutting issue we don't give it much of t e attention it deserves."*

4.2.3 Appropriateness of Teaching EE in the Two Colleges

Figure 4.1 on page 43 reveals the respondents' feelings about the inclusion and teaching EE in the two colleges in response to questio B3 and B4 of the questionnaire (Appendix A). While all the respondents indicated that it was necessary to include and teach EE at the pre-service teacher education, they differed

on whether the inclusion and teaching EE at pre-service was “rightly included” or “wrongly included” or “not sure”.

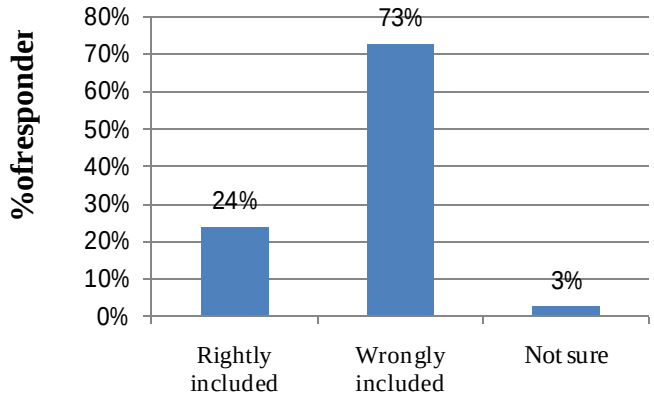

Fig. 4.1 College teacher educators' responses to the i clusion of EE in the curriculum

Source: Field data (2010)

The majority (73 per cent) of the respondents claimed that the inclusion of EE in the teacher education curriculum was wrongly done. The res suggested that the majority of respondents are not in agreement with the Ministry of Education’s policy of including EE as a crosscutting issue in the curriculum.

4.3 Degree of College Teacher Educators’ Participation in Teaching EE in the Two Colleges

The second research question sought to determine the degree of teacher educators’ participation in teaching EE in colleges of education. Results on this aspect are reported below.

4.3.1 Teaching EE in Study Area Lessons

Question C1 of the appendix A asked the participants whether they include EE in their lessons and what evidence was there to show that it was taught. The suggested responses were “yes,” “maybe” and “no”. The results are featured in Figure 4.2 on page 45. The results in Figure 4.2 reveal that there was a slight difference between respondents who taught EE (about 39.4 per cent) and th se who didn’t (42.4 per cent). It was also noted that a significant number of the respondents were not ure about their involvement in teaching EE.

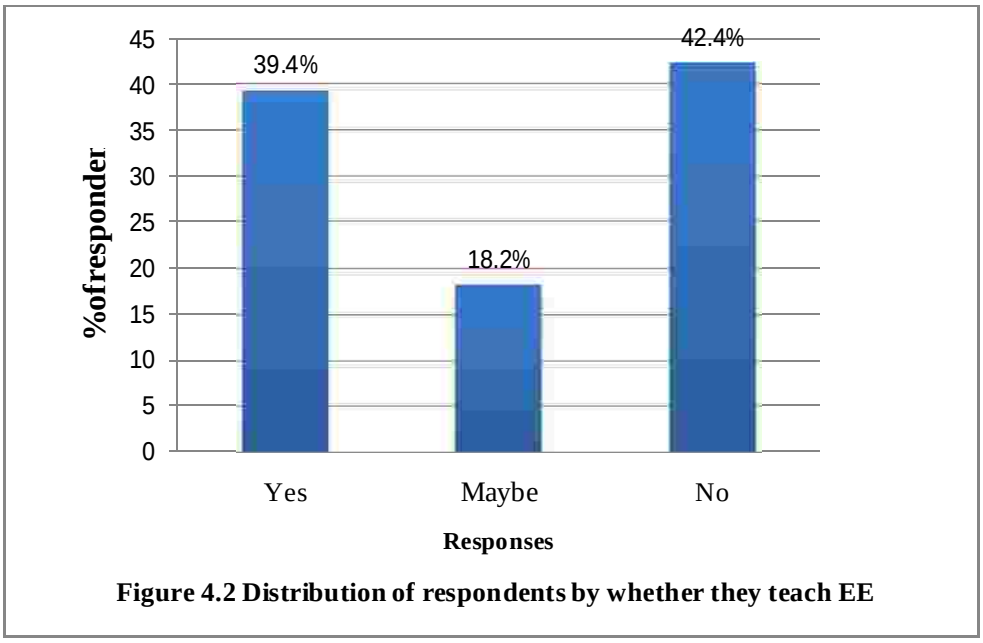

Figure 4.2 Distribution of respondents by whether they teach EE

Source: Field data (2010)

From Figure 4.2, it is seen that EE existed in the two colleges, though only a few teacher educators were teaching it. The existence of 18.2 per cent of the respondents whose responses was "maybe" suggests that teaching EE n the two colleges was not well defined, that is, whether it was compulsory or optional. Within TS study area some respondents claimed to teach EE while others did not. This indicated that respondents in TS lacked adequate knowledge to identif hat comprised EE in their teaching. The results also suggest that the policy of EE as a crosscutting issue in the curriculum in the two was unclear to the implementers and did not compel them to teach it.

Subsequent analysis of responses on teaching EE indicated that EE was taught in SE, SSME and TS study areas while it was not taught in EA, LLE, ME and ES study areas. The findings further suggested that teaching EE was certain in SE, SSME and TS, and simply by chance in EA, ES, LLE and ME study areas. The respondents who claimed to include EE in their lessons stated that he syllabi contained EE topics or EE related topics. Some respondents also cited the existence of PMS supervision lists, a clean environment in the college, and projects su h as production unit (gardens and piggery) as evidence enough that EE exist d in the two colleges.

4.3.2 Priority of Teaching EE among Teacher Educators in their Lessons

Figure 4.3 shows the distribution of respondents by opinion on whether teaching EE was a priority in their study area lessons in response to question C2 of appendix B. The suggested responses were "strongly disagree", "disagree", "not sure", "agree", or "strongly agree".

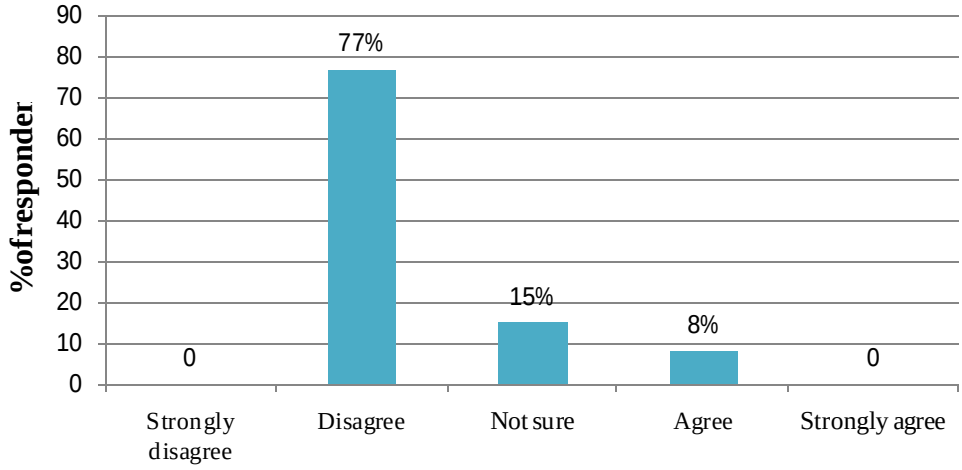

Figure 4.3 : Distribution of respondents by opinion on teaching EE as a priority

Source: Field data (2010)

Figure 4.3 reveals that none of the respondents indicated "strongly disagree" or "strongly agree" to teaching EE as a priority in their lessons. However, there were disparities among the respondents who claimed to teach EE in the way they treated EE in their lessons. The majority (77 per cent) of th respondents indicated that teaching EE was not priority and that it was only taug when EE topics or sub-topics appeared in the study area's schemes of work. The results also suggest that teaching EE was at the mercy of the respondents in the two colleges as it was not taken as a priority in all the lessons. Only eight per nt of the respondents considered inclusion of EE as a priority in their lessons and these were from SE study area.

4.3.3 Area of Focus When Teaching EE

Question C4 of the questionnaire (Appendix A) sought to discover the area of EE on which respondents focussed on during lesson presentations. Only respondents from SE, SSME and TS answered this question as they claimed to teach EE. The suggested responses were "content only" or "methodology only" or "content and

methodology" or "action for the environment" or "other , specify...." The results are shown in Figure 4.4 below.

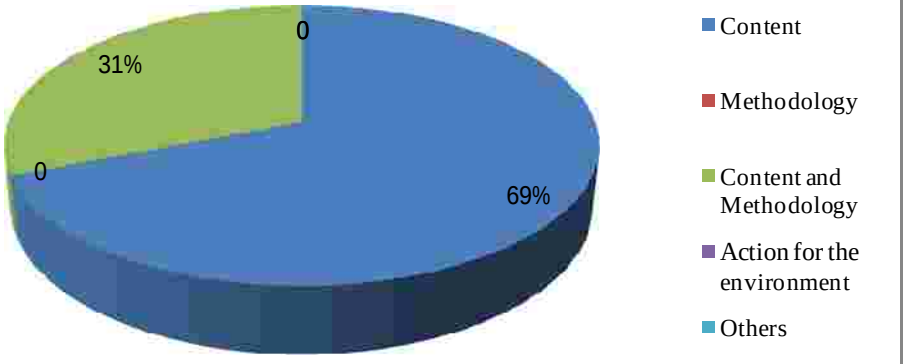

Figure 4.4 Area of EE respondents focused on during EE lessons

Source: Field data (2010)

Figure 4.4 reveals that none of the respondents indicated "action for the environment" or "methodology" or "other" as their preferred options. The majority (69 per cent) of the respondents concentrated mainly on imparting content while a few (31 per cent) concentrated on imparting "content a methodology". The results suggested that the respondents' emphasis was on teaching knowledge and understanding of environmental issues with very little on how EE should be taught and nothing on "action for the environment". The emphasis of "content" in teaching EE and not "action for the environment" imply that fact-based EE or normative EE characterise EE teaching by the respondents as outlined in Table 2.1 in Chapter Two.

4.3.4 Methods Frequently Used in Teaching EE

Question C5 of Appendix A, required the respondents who claimed to teach EE in their lessons to list three methods that they frequently used in teaching environmental issues in their lessons. Five teaching methods emerged from the responses and these are featured in Table 4.5 on page 7. Overall, a larger percentage of responses indicated question and answer, and lecture (36.7 per cent and 26.7 per cent respectively) as the most frequently used methods respectively. The results further indicated that EE was frequently t through teacher centred approach which did not promote active learners' partic pation.

Table 4.5 Methods Used in Teaching EE

Methods used in teaching EE	Frequency	Percentage %
• Demonstration	1	3.3
• Discussion	4	20
• Lecture	8	26.7
• Role play	1	3.3
• Question and answer	12	36.7
• Field trips- (Nature walks)	2	6.7
• Project	1	3.3
Total	**30**	**100**

Source: Field data (2010)

The under utilisation of project, role play, and field trips in teaching EE suggested that respondents did not emphasise the complexity of e onmental issues and the need for students to develop critical thinking and pro solving skills as practical activities were not part of approaches frequently used in teaching EE.

4.3.5 Reasons for Not Teaching EE in Study Area Lessons

In question C6 of Appendix A, respondents who claimed teach or include EE in their lessons were asked to give reasons why they do not do it. These respondents (42.4 per cent) were from ES, ME, LLE and EA study areas (see Figure 4.2 on page 44). The reasons that emerged from the respondents for not teaching or including EE were categorised into the six themes after analysing t em and presenting them in Table 4.3**.**

Table 4.6: Reasons for Not Teaching EE

Reason for not teaching EE	Frequency (n)	Percentage %
• Lack of knowledge and skills	12	35.7
• Not included in the study area syllabus	7	20.6
• Not broken down to teachable content in the syllabus	3	8.8
• Limited time /curriculum overload	6	17.6
• It is not examinable	5	14.7
• No resources to use	1	3.0
Total	**34***	**100**

Source: Field data (2010)

**Note: n > 13, each respondent stated more than one response to the question*

Responses that reflected lack of knowledge and skills counted for about 35.7 per cent. For example; “I have not received any training o how to teach EE” or “I do not know what and how to teach EE” while 20.6 per cent of the responses reflected

non-inclusion of EE in the study area syllabus, for example; "H do you expect me to teach what is not outlined in the syllabus" or "My study area topics are not related to EE". However, 8.8 per cent of the responses pointed out that EE was not broken down into teachable contents in the syllabus, for example, "Environment on its own was too broad and it is difficult to know what to teach" or "It is just a statement without any supporting content to teach."

In addition, 17.6 per cent of the responses indicated ited or lack of time, for example; "There is no time to integrate EE, the curric was overloaded" or "There is a lot of content to cover so there is no room for other things". Meanwhile, 14.7 per cent of the responses proposed that EE was not examinable, for example; "It is never included in examination" or "I only prepare s udents to pass the examinations hence, I only concentrated on teaching issues that are examinable". Lastly, three percent of the responses reflected lack f resources as a reason for not teaching EE.

Subsequent analysis of the responses suggested the majority (79.4 per cent) of the respondents had knowledge that EE should be taught in eir study areas but there were some other factors that impeded them from teaching it as outlined in Table 4.6.

4.3.6 EE Activities outside the Classroom

Question C7 of appendix A asked the respondents whethe they participated in EE activities outside the classroom. The majority (64 per cent) of the respondents claimed that they participated in EE activities outside the classrooms. The results for EE activities outside the classroom are featured in Table 4.7.

Table 4.7: Activities outside the Classrooms in which Respondents Participate

Types of activities	**Frequency** (n)	Percentage%
• Clubs	3	11
• Preventive maintenance systems	19	68
• Environmental day commemoration	2	7
• Production Unit	4	14
Total	28*	100

Source: Field Data (2010)

**Note n > 21, respondents were involved in more than o e activity outside the classroom*

Out of the 21 participants who claimed to participate in activities outside the classroom, 11 percent of the respondents were involved in clubs, for example, "Cultural" or "Dance groups", or "Environmental", or " nservation". The majority (68 percent) of the respondents were involved in PMS, for example; "Keep Zambia clean campaign or college surroundings cleaning", or "Repairing of table and chairs". Only seven percent of the respondents were involved in environmental day commemorations such as "Environmental day on 1st June" or World Water Day" or "Tree planting day". The remaining 14 percent of respo nts were involved in Production units e.g. "Gardening" or "Piggery manageme t".

Through the FDGs, it was also discovered that during PMS, students were given tasks and respondents (teacher educators) were only interested in the quality of work done and not using PMS as a learning space for EE. Students had no say in deciding what, when and how PMS was done as it was the duty of he college administration and teacher educators to decide. However, respondents from TS study area categorically stated that PMS was a topic in the study area syllabus and was taught to students.

4.3.7 Classroom Lesson Observations

The classroom observations made during lessons present d by the respondents revealed the following results:

4.3.7.1 Opportunity to Integrate Environmental Issues

The actual observation made by the researcher during l sson presentations revealed in all the lessons that respondents presented had opportunities to integrate environmental issues. For example, a respondent teaching on 'Bil ' in ME focused on the calculations of costs and units consumed of electricity, water and telephone bills but mentioned nothing on how students help to reduce the same bills or the impact of huge bills on the environment.

4.3.7.2 Approaches Used to Teach Environmental Issues

It was observed that teacher educators from SE, SSME a d TS teach environmental issues when they only appear as topics in the syllabus or schemes of work while the rest of the teacher educators either did not integrate it in their lessons or it was superficially integrated. For example, during a LLE le on teaching New

Breakthrough To Literacy (NBTL), the teacher educator and students mention the materials found in the environment which can be used to enhance teaching of languages such as trees, animals, people and soil. But nothing was mentioned about the sustainability or care for these.

It was further noted that only respondents who teach environmental issues as topics planned and included the work in their lecturer plans. It was also interesting to note that the teacher educators generally dominated their lessons, that is, they talked for a longer time than the combined students' time in the lesson. Students' participation was mainly through question and answer sessions and this was primarily in lesson conclusion. All the lessons observed were all conducted in the classroom and question and answer, and lecture methods were dominantly used. In addition, the majority of the respondents did show concern about the natural aspect of the environment through PMS.

4.3.7.3 Focus Area of EE Teaching

Of the few teacher educators observed teaching environmental issues, the lessons were generally content-focussed rather than problem solving or focussed on critical thinking skills. The teacher educators seemed to be more concerned with teaching knowledge – 'book based' than the application of knowledge to addressing environmental issues affecting either the local area or community. The respondents' primary focus was on creating awareness, knowledge and understanding and not skill formation or use.

4.4 Effectiveness of the crosscutting issue approach used in teaching EE

The third research question of the study sought to investigate the effectiveness of the crosscutting issue approach used in teaching EE in two institutions. The results of this research question are reported below.

4.4.1 Environmental Topics in Study Area Syllabus

Question D1 of Appendix A asked the respondents whether the study areas syllabi contained specific environmental topics and how they de what, when and how to teach environment in their lessons in the absence of tpic or content in the syllabus.

4.4.1.1 Environmental topics or content contained study area syllabus

The knowledge of respondents with regards to environme tal topics or content in the study area syllabus is indicated in Table 4.8 below.

Table 4.8: Study Area Syllabi Containing Environmental Topics

Study area	Does your study area syllabus contain specific environmental topics to teach?		Total
	Yes	**No**	
• ES	0	4	**4**
• LLE	1	4	**5**
• ME	0	4	**4**
• SE	4	0	**4**
• SSME	4	0	**4**
• EA	1	5	**6**
• TS	4	2	**6**
Total	**14 (42%)**	**19 (58%)**	**33**

Source: Field data (2010)

All respondents teaching ES and ME claimed that their study area syllabi did not contain specific environmental topics or content while all respondents teaching SE and SSME accepted that their study area syllabi contained specific environmental topics and content. However, respondents teaching LLE, EA and TS had different views. The majority (80 per cent) of respondents teaching LLE claimed that the LLE syllabus did not contain specific environmental topics and content. As seen from Table 4.9, 83 per cent of EA respondents claimed that the study area syllabus did not contain environmental topics and content. On the other hand, 67 per cent of respondents teaching TS claimed that the study area syllabus did not contain specific environmental topics and content.

Overall, 58 per cent of the respondents claimed that the syllabi did not contain specific environmental topics or content as opposed to 42 per cent who believed the syllabi did. The results suggested that a fairly large number of respondents had no guide on what and how to teach EE as the syllabi was silent on the issue. This could also imply that teaching EE as a crosscutting issue po a challenge even to respondents who claimed that their syllabus did contain EE, as its teaching was left to individual lecturer to decide what, when and how to teach it in class. However,

analysis of the syllabi indicated that all study areas had incorporated HIV/AIDS in their study area schemes of work, though it was not cited as a component of EE.

4.4.1.2 Teaching EE in the Absence of Topics or Content in the Syllabus

Respondents (58 per cent) who claimed that their study ar a syllabus did not contain environmental topics or content were asked how they de ided what, when and how to teach EE in the absence of topics in the syllabus. themes emerged from the responses, namely EE was mentioned only in passing, or it was avoided and not taught at all. For example, "What to teach usually is not planned but it may come in form of an illustration, for example when teaching composition in LLE, I may refer to the environment as a good material to write about and this happens once in blue moon."

4.4.2 Mechanism to Ensure Teacher Educators Included EE in Their Lessons

In question D5 of the questionnaire (Appendix A), respondents were asked if there was any mechanism put in place by the study area or co lege to ensure that EE was taught in their lessons. The expected responses were ' es' or 'No'.

Table 4.9: Existence of a mechanism to make respondents teach EE

Was there a mechanism to make the respondents teach EE	**Frequency**	**Percentage (%)**
• Yes	10	30
• No	23	70
Totals	**33**	**100**

Source: Field Data (2010)

The results revealed that majority of the respondents per cent) indicated that there was no mechanism put in place either by the study area or college to ensure that EE was taught. The results further suggested that respondents were not in any way compelled to teach EE unless when they felt like. er, 30 per cent of the respondents indicated that there was a mechanism to ensure EE was taught. They cited the inclusion of environmental related topics in the syllabus and schemes of work as a way of ensuring EE was taught in the study areas.

4.4.3 Challenges of Using a Crosscutting Issue Approach in EE

Question D6 of the questionnaire (Appendix A) and question 5 of FGD (Appendix D) asked the respondents to identify and explain the challenges that they encountered in teaching EE as a crosscutting issue. Respondents generated a lengthy list of challenges encountered in teaching EE in their lessons. Core findings are summarised as follows under eight identified themes;

4.4.3.1 Curriculum was Unclear

Respondents identified the curriculum as the first barrier to teaching EE in he two colleges. The challenges related to curriculum were;

a. The syllabi did not specify topics and content to teach under EE. In short the syllabi did not contain EE topics except in SE, SSME and TS study areas. For example, "It all begins with the curriculum itself which is not ar. There is nothing apart from the statement that crosscutting iss es in this case environment should be taught in every study area. So how do I tell what and when to teach it? In short, the curriculum is not clear on how we need t include EE." Another issue brought out was that topics in the syllabus were unrelated to EE, which made it difficult to integrate EE in them.
b. The syllabi or teacher education curriculum was overloaded. For example, "The current syllabi were so overloaded that there was no room for more work. Even if I was trained and had the necessary knowledge and skills, and reference books are available, still it will not be possible to teach EE. If we fail to complete teaching the work in the current syllabus, how possible is it that we can dare to include in more work and finish teaching it?"
c. The curriculum was examination-driven. Respondents claimed that they primarily prepare students to pass examinations. They questioned the wisdom of someone to teach EE that was not included in the students' final examinations at the expense of material which was examinable. For example, "Teaching EE consumes time to complete the outlined content in the syllabus". Another issue raised on examination was setting of questions. Respondents were quoted as having said "When setting questions for the examination EE has no standard reference point ... content to base the questions on, how do you know what was covered or left out as it is left to individual lecturer's discretion whether to teach

it or not?" Respondents felt it was difficult to set questions that would be fair to all students as different things were covered.

4.4.3.2 Lack of Guidelines on Teaching EE

There were a number of insights from the discussions that confirmed that lack of guidelines on EE impeded its teaching. For example, a respondent explained that "There are no guidelines to encourage teaching EE in all study areas in the college. So, I can not say it is a priority to me if not a burden. I do not teach it when I am supposed to" or "a mere statement that environment should be taught as a crosscutting issue in all study areas is not helpful".

4.4.3.3 Lack of Knowledge and Skills by the Respondents

It was evident from the respondents that they lacked knowledge and skills to effectively implement EE in their lessons. The knowledge and skills in EE required were grouped into two, what to teach and how to teach. For example, "EE can not be taught by incompetent lecturer like me!" or "For without knowledge about EE, I would not want to show my ignorance to students" or "If somebody is asking about knowledge and skills of teaching EE, I confess I am surely incompetent in this area".

4.4.3.4 Pressure from Limited Time

Disappointment was also expressed concerning the time ailable to the respondents to integrate EE. Respondents stated that there was limited time. For example "...each study area has specific topics to cover and those topics are supposed to be covered in that stipulated time – nine terms. Introducing EE will mean we will not have adequate time to complete the outlined content ..." Moreover, they had many classes to teach and it was difficult to find time to integrat E in their lessons.

4.4.3.5 Negative Attitude of Respondents

There were many elements of the discussion that revealed that negative attitude of respondents was a challenge to the inclusion of EE in lessons in the two olleges. Implicitly respondents seemed unwilling to teach EE though all accepted that it was an important component of teacher education curriculum. Respondents were quoted as saying; "Sorry I am getting a bit confused, what type of EE are we looking at? Why should we not leave EE to specialists like SE and SSME? We are not specialists" or "We have taken in so much by following the topics in the syllabus...

what we are supposed to cover ... the body of content. his has made it difficult to teach as EE without topics hence it is left to individ al lecturer with will power to include it ."

4.4.3.6 Lack of Ownership of EE

It was particularly evident that respondents from ES, LLE, ME and EA study areas who had no environmental topics or related topics in their syllabus were not eager to integrate EE in their study area. They felt EE was not their concern. For example, "Have you ever heard about the tragedy of the commons? If no one owns something there is no care for it so is the case with EE. So long as EE was a common issue college teacher educators expected the other study areas to teach it and in the end it dies out and remains only in study areas where it comes as topics" or "The perception among teacher educators was that the experts of EE are Science teacher educators. They were the people who are competent to articulate the issues in EE, so much that it was even included in the syllabus for them."

4.4.3.7 Lack of Resources

Lack of and inadequate resources in terms of funds, support, and, teaching and learning materials was stated as a challenge to teaching EE in the two colleges. According to respondents, without resources, it was very difficult to teach EE. For example, "When you look at the concept itself, it was an emerging concept and not enough teaching material was available. For us who are teaching it, we find it difficult to get the reference materials. Last time I was teaching on Education for Sustainable Development and there is no single book referring to it in the college" or "... It is also difficult to organise field trips due to lack of resources and big number of students available."

4.4.3.8 Failure to Plan across the Curriculum

This challenge originated from respondents teaching SSME and SE. It was evident that these study areas shared the same environmental topics and usually these topics were taught almost at the same time. And there was no attempt by study areas to team plan the work to avoid repetitions. Example included, "There was serious repetition of work taught to students. For instance, SE and SSME both teach climate change and pollution. Worse still, these topics are taught almost at the same time".

4.5 Training Needs of College Teacher Educators With Regards To EE

The last research question sought to establish the training needs of college teacher educators in EE. The findings on the training needs are featured below.

4.5.1 EE as Component of Pre-Service Teacher Training for Respondents

Figure 4.5 shows responses on whether or not the pre-service teacher training programmes which respondents undertook did contain EE stated in Appendix A question E1.

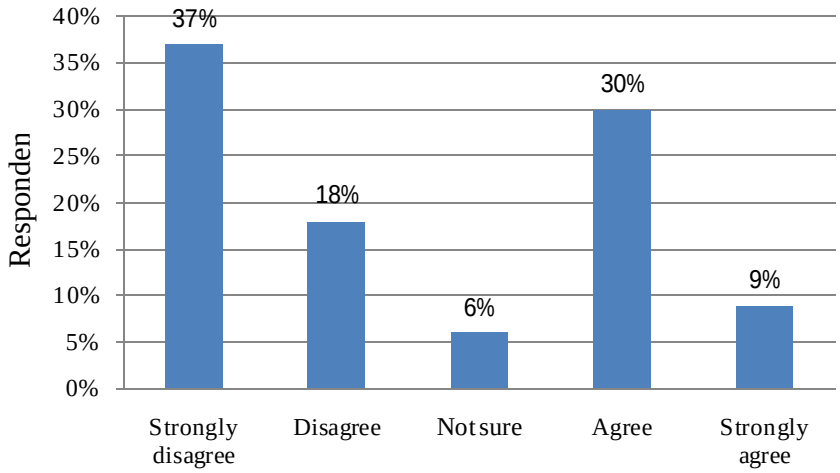

Figure 4.5: Distribution of respondents by opinion on whether or not EE was a component of their pre-service training programmes

Source: Field data (2010)

The results revealed that more than half of the respondents (55 per cent) did not have EE as a component in their pre-service teacher training programmes. The absence of EE component in pre-service teacher training programmes suggests that the respondents lacked the necessary skills and knowledge to effe tively implement it unless they later had undertaken in-service training in EE.

4.5.2 Adequacy of EE Knowledge and Skills in Pre-Service Teacher Training

Question E2 of Appendix A asked the respondents who claimed to have received training during their pre-service teacher training whether the knowledge and ski acquired were adequate for them to effectively integrate EE in their lessons. Only 13 out of 33 respondents provided the responses to this question. Results are featured in Figure 4.6 on the next page.

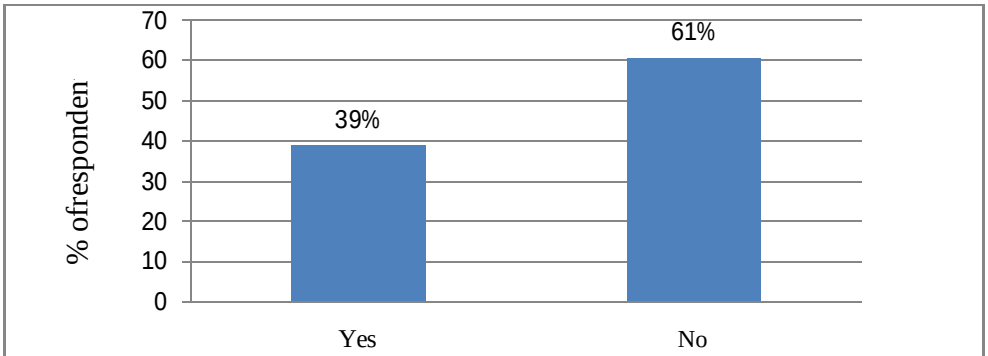

Figure 4.6 Adequacy of EE knowledge and skills of re ents

Source: Field data (2010)

The majority (61 per cent) of the respondents claimed that the EE knowledge and skills acquired from their pre-service training was inadequate for them to competently incorporate EE in their lessons. However, e remaining 39 per cent of the respondents stated that their knowledge and skills were adequate to teach EE and these were from SE and SSME study areas. The results revealed that pre-service teacher training received by the majority of the respondents in EE was not in line with the work they were performing as college teacher educators.

4.5.3 EE In-Service Training Programmes for Teacher Educators

In question E3 of Appendix A, participants were asked o state whether they had attended any in-service training programmes in EE or not, and state th organisation or institution that provided the training and the competencies developed. The results are featured in Table 4.10 below.

Table 4.10: In-Service Training in EE according to the Study Areas

Study area	Have the respondent attended any in-service training in EE		Total
	Yes	No	
ES	2	2	4
LLE	1	4	5
ME	1	3	4
SE	2	2	4
SSME	3	1	4
EA	0	6	6
TS	2	4	6
Total	**11(33%)**	**22 (67%)**	**33**

Source: Field data (2010)

Respondents from EA study area claimed to have had no in-service training in EE while the highest attendance of in-service training was recorded from respondents in SSME study area. Table 4.10 further reveals that the p rcentage of respondents who did not attend any in-service training was higher than those who attended ex in SSME, ES and SE. Overall, the majority (67 per cent of the respondents) had not received any in–service training in EE, implying that if they were teaching EE in their lessons they depended on their pre-service knowledge and skills or on their personal effort (job-on training).

4.5.3.1 Organisations that Provided In-Service Training in EE

The results of question E3 of Appendix A asked the res ondents to state organisations or institutions that offered in-service training to them. The results are shown in Figure 4.7 below.

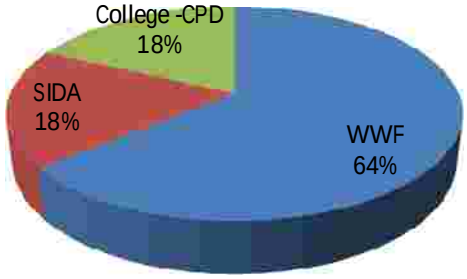

Figure 4.7: Organisations that offered in-service training in EE

Source: Field Data (2010)

WWF, Colleges and SIDA were the three organisations th provided in-service training in EE to the respondents. The majority (64 per cent) of the respondents received in-service training from WWF. According to the respondents "WWF provided in-service training in management of community EE project from 2003 to 2005 in Kabwe" and also "on the use of college tutors' guide for EE in respective colleges of education in 2000". Meanwhile, the 18 per ent of respondents attended in-service training in EE with SIDA and it was based on the management of PMS. The remaining respondents (18 per cent) attended in-house CPD training on HIV/AIDS in 2003.

4.5.3.2 Competencies Gained From the In-Service Training Programme in EE

In responding to question E3 of Appendix A which asked the respondents to state the competencies gained from in-service training in EE, five themes emerged as tabulated in Table 4.11.

Table 4.11: Competencies Gained from In-Service Training in EE

Theme	**Frequency** (n)	Percentage %
• How to teach EE	3	13
• Knowledge about EE (Content)	10	42
• Community partnership	7	29
• Localising the curriculum	1	4
• Material production	1	4
• Management of PMS	2	8
Total	**24***	**100**

Source: Field data (2010)

**Note: n > 11 as some respondents gave more than one response*

Table 4.11 indicates that priority of 42 per cent of in-service training activities respondents undertook were related to acquisition of k owledge about EE. However, 13 per cent of in-service training in EE were organised on how to teach E and 29 per cent on community partnership. A few training sessions were aimed at teaching the respondents on localising the curriculum and material production in EE. The results indicated that though respondents had received some in-service training in EE, not all areas of EE were covered namely ecology, conceptual nvironmental awareness, environmental issue investigation and evaluation and environmental action skills to enable them effectively teach EE as recommended by UNESCO.

4.5.4 Training of Teacher Educators in EE

Respondents in question E4 of appendix A were asked wh ther it was necessary for them to undergo training in EE. Unanimously respondent (100 per cent) stated that they needed to undergo training in EE. The results suggested that respondents were not competent enough to integrate EE in their lessons d that EE was not effectively implemented. The results further suggest that there was need to develop in-service training for the respondents in EE in the two institutions.

4.5.5 Identified Training Needs in EE for College Teacher Educators

Question E5 of Appendix A asked the participants to identify ar as in which they needed training in order to enhance their capacities in teaching EE. From participants' responses five categories of training ne ds in EE emerged as shown in Table 4.12.

Table 4.12 Specific Areas for Training Respondents in EE

Theme	Frequency (n)	Percentage %
Content in EE	5	11
Methodology in EE	3	7
Content and methodology	11	24
Material production	1	2
All components of EE	26	56
Total	46*	100

Source: Field data (2010)

**Note: n > 33 as some respondents gave two or more responses*

Overall, 56 per cent of the responses indicated training was sought in all aspects of EE, for example, "what EE is about, how it should be t ught and assessed, and how to produce materials to enhance its teaching" or "I ne be trained in all aspects of EE" or "A full EE programme". While 24 per cent of the responses suggested that training was needed in both content and methodology of EE. For example, "I need to be trained in what to teach and how to teach" or "How o integrate EE in my lessons and what I should teach the students in the lesson" or "What methods, approaches to use when teaching EE and the content to teach." The ot r responses that included content only accounted for 11 per cent of the total responses. For example, "What to teach to the students" or "Specific content to teach."

Out of the 46 responses, seven percent stated methodology as the specific area for training. For example; "How can I meaningfully integrate EE in my lessons" or "Methods and strategies that are used in teaching EE" or "Use of the local resources in the teaching of EE". Lastly, two percent of the res es suggested material production for training needs, for example, "How to produce teaching and learning resources in EE."

4.6 Process of Teaching EE by Teacher Educators

In this study, curricular materials such as teaching files and students' note books were analysed in order to determine further the processes of college teacher educators' participation in teaching EE.

4.6.1 Teaching-Learning Activities in the Respondents Teaching Files

An analysis of the respondents' teaching files for second term 2010 revealed that only teacher educators in SE, SSME and TS study areas ed EE in their schemes of work with specific content to teach. Furthe re, it was noted that in SE schemes of work for MACE it was clearly indicated as E In the remaining respondents' teaching files, there was no indication o mention that EE was taught. However, all study areas had a component of HIV/AIDS in their syllabi and fully addressed in the syllabi and schemes of work. Though HIV/AIDS comes under EE, it was treated as a separate entity as it appeared as separate crosscutting issue from EE.

The teaching approaches used by college teacher educat for EE were mainly lecture, question and answer, and group discussions. The area of focus in teaching EE was mainly on knowledge dissemination. This contrad cted the earlier responses given from the questionnaires (Appendix A) which state demonstration, role play, field trips and project as other methods used in teaching EE.

4.6.2 Learning Activities Recorded By Students in Their Note Books

A critical analysis of the students note books reveale that only SE, SSME and TS had EE component covered and existed in 'raw' notes fo m written during lectures. Moreover, there were no signs of practical work or field work with regard to teaching EE.

Chapter Five

Discussion of Results

5.0 Introduction

This chapter discusses the findings presented in Chapter Four. The analysis of the results links the research findings and the literature in Chapter Two. In analysing the results, the respondents' perceptions and level of participation will be compared to the established goals, objectives and principles of EE as outlined by Tbilisi Conference. The research questions in this study relate to the views of teacher educators on teaching EE, participation of teacher educators in EE, the effectiveness of the crosscutting issue approach used in teaching EE and training needs of teacher educators in EE.

5.1 Views of College Teacher Educators on Teaching EE

To a greater extent, a person's view on environmental ues and their individual environmental concerns influence the way they approach and conduct EE (Sandell *et al*, 2003). Four themes emerged from the questionnaires and FGDs on the respondents' understanding of EE as shown in Table 4.4. The responses exemplify that EE was viewed differently by the College Teacher ucators (Beckford, 2008; Sandell *et al*, 2003; Le Roux, 2001; Rao &Reddy, 1997). The majority of the respondents located their description of EE in one of he three Tbilisi conference EE goals that of creation awareness about the environment EE should foster a clear awareness of, and concerns about economic, social, pol l and ecological interdependence in urban and rural areas (Rao & Reddy, 1997; UNESCO, 1977). It is important to note that environmental awareness is a limited term, which means having knowledge about the environment and in some cas s it is used interchangeably with EE (ECZ, 2000). However, EE is a broader term which encompasses awareness, knowledge, attitudes, values and participation. It must not be seen merely as a strategy for creating awareness of the environment, but also as a means towards developing positive concern for maintaining the quality of our life on earth (Le Roux, 2003; Otiende *et al*, 1997; UNESCO, 1985).

This view of EE in terms of creation of awareness abou the environment entails that the other two goals of EE were immensely ignored and it had a direct effect on how it was taught. It is upon the EE objectives that the contents of the curriculum would

depend (Rao & Reddy, 1997). Since EE was viewed as creating awareness or acquisition of knowledge, even the way it was taught reflected merely imparting knowledge into students. Teachers' pedagogical practic are related to their views (Hart, 2003). The lack of shared understanding of what EE is was found to b a major hindrance in incorporating it into teacher education (Beckford, 2008). The effectiveness of EE relies heavily on the knowledge, s and attitudes of the educator. EE is not a change in 'what' is being taught (the content), but also a new perspective on 'why' (the objectives and goals) and 'h ' (the approaches and attitudes) (Pandya, 2000).

EE today has come to include all three orientations with facts *about*, experiences *in*, and action *for* the environment although the tendency is to favour EE *for* the environment and this does not necessarily exclude the ther two orientations which are appropriate in certain contexts (Le Roux, 2001; Ra & Reddy, 1996). The majority of the respondents viewed it as creating awareness about the environment which is education *about* the environment. A few respondents viewed it as education *in* and *for* the environment. This situation was understandable as was a new field in Zambia (Namafe, 2008). However, there was need to emphasise the other two forms of EE too.

5.1.1 Interpretation of EE in Terms of the Natural or Ecological Aspect

From the findings on the teacher educators' interpretation of EE, it was evident that respondents interpreted EE in terms of natural or ecological conservation. This interpretation of EE lacked the view of the environment from totality as outlined in the principles of EE. EE should consider the environment in its totality (Le Roux, 2001; Rao & Reddy 1996; UNESCO, 1985). The way a teach r educator perceives environment will restrict his/her participation in its teaching (Sandell *et al*, 2003). The narrow view of EE in terms of natural or ecological aspect, in the researcher's view could be the reason why it is perceived to be sci fically oriented. According to Bowers (2004), the major weakness of the traditional approach to EE is that it does not address the systemic reasons that the rate of environmental degradation has now exceeded what science and technology can reverse. erefore, the narrow perception of EE calls for a broadened scope as implied in Tbilisi Declaration, Bruntland Commission Report and Agenda 21.

5.1.2 The Position of EE in the Two Colleges

The responses from the college teacher educators confirmed that EE existed in all study areas as a crosscutting issue in principle only. All study areas did not integrate it as a crosscutting issue. This fits well with Jones (1996) findings that EE is more of a policy than a practice. This situation suggested that there was a gap between the policy and its implementation. Such statement as "... n theory it was there except it was silent" implies that respondents had failed to interpret and implement the crosscutting issue policy. According to Cohen and Ball (1990), when teachers implement the policy, they do so in terms of their pre-existing practice, knowledge and beliefs and they can frame the policy in terms of what they already know, believe and do in classrooms. Nonetheless, EE should be taught across the primary teacher education curriculum (CDC, 2001). In practice, EE primarily existed not as a crosscutting issue but as topics in SE, SSME and TS. In view of the researcher, this agrees with Palmer (1998) who noted a gap between inte d or mandated and interpreted EE. She called this gap the rhetoric-reality (Palmer ibid). From an EE policy point of view, there are numerous policies that have been developed, although many of them are not 'in use' or are not being effecti ely implemented (Lotz-Sisitka, 2004). In the two colleges under study the crosscutting issue policy of teaching EE was not effectively implemented.

Although EE existed in principle only as a crosscutting issue, it was a main curricular activity in SE, SSME and TS. In these study areas, teaching EE was not treated as a crosscutting issue but as topics. However, it also existed as an extra curricular activity. As an extra curricular activity, it existed in PMS and clubs in the two colleges. EE works both in and outside the classro d experience outside the classroom is an important instructional strategy for engaging students in direct discovery of the world around them (Fien, n.d.). However, in both colleges, Environmental Clubs were seen to provide learning spac for EE. Through clubs, students developed an individual's understanding, skills and feelings of empowerment that are necessary for positive behaviour owards the biophysical and social environment in every day living, and efforts to actively participate in groups to find the optimum solutions for environmental problems UNESCO, 1985).

5.1.3 Appropriateness of Teaching EE in Colleges of Education

The majority (73 per cent) of the respondents claimed hat EE was 'wrongly included' in the Teacher Education Curriculum as a cro scutting issue. According to the respondents, SSME and SE should have been the only tudy areas to teach it. In the view of the researcher, EE was latently viewed by respondents as a separate subject or a special topic. This assertion is shared by Jones (1996) that EE is usually viewed as a separate subject or as a special topic. However, the key to any change in formal educational system is the teacher, unless the teacher is convinced about EE and feels competent to handle it, very little would ch ge. The perception that EE was 'wrongly included' as a crosscutting issue in the curriculum by the respondents implies that they were not convinced about it being taught in all study areas. According to Pandya (2000), a teacher has to internalise a change in his/her role from one of 'giver of knowledge' to 'facilitator' in the learning process. The respondents' claim that EE was wrongly included in the curriculum seemed to suggest that they did not internalise the change and a pt that every teacher educator should incorporate EE in his/her lessons.

However, the inclusion of EE as a crosscutting issue in the curriculum was appropriate. This is asserted by most literature and scholars (UNESCO, 1985; Beckford, 2008; Jones, 1996; European commission, 1997). EE is not to be added to educational programmes as a separate discipline or subject for study, but as a dimension to be integrated into them (UNESCO, 1985; Pandya, 2000). It is also worth mentioning that EE is the result of a reorientat of various disciplines and of various educational experiences providing an integrated perception of the environment (Fien, n.d.). A closer look at the issue seems to suggest that, ther was lack of knowledge and skills required to integrate EE all study areas. Lack of integration creates the perception that EE is a specia topic (Jones, 1996).

5.2 The Extent of College Teacher Educators' Participation in Teaching EE

The results revealed that teaching EE was done in SE, SSME and TS study areas and that the majority of the respondents did not treat teaching EE as a priority in their lessons. The majority of the respondents focused on teaching EE content o the students than imparting skills and attitudes needed by students to act for the environment.

5.2.1 Teaching EE in the Two Colleges

Figure 4.2 reveals that 39.4 per cent of the responden s indicated that EE was taught in SE, SSME and TS. According to Gough (1992), some subjects by their nature, present greater opportunities for the infusion of EE, t all have a role to play. SE, SSME and TS presented greater opportunities for infusing EE. However, 18.2 percent of the respondents from EA, LLE, ME and ES stu areas were not sure whether they included EE in their lessons and the rema ning 42.4 percent of the respondents mainly from EA, ES, LLE and ME study areas claimed not to teach EE. The results indicated that there were discrepancies in the way EE as implemented in the two colleges. According to Fien (n.d.), it is t responsibility of every teacher to infuse EE into his or her teaching in order to help students to live and work towards a more sustainable environment for all. The teaching of EE a a crosscutting issue was not attained in the two institutions.

EE should be a compulsory component of every study are and every college teacher educator is expected to teach it (CDC, 2008). Nevertheless, the results indicated that a larger portion of the respondents were not teaching t while others were not sure whether they taught it. In view of this, the researcher may suggest that teaching EE by the respondents was optional and its teaching depended on an individual teacher educator or study area. This agrees with a number of literatures that state that usually teaching of EE is done through individual effort of on or two committed teachers (Jones, 1996; Power, 2004; Beckford 2008; Gough, 2009) The main contributing factor cited by the respondents for not including or t aching EE was that it had no specific topics or content in the syllabus. According to the European Commission (2008), one implication of using the crosscutting issue approach of teaching EE, curriculum documents do not necessarily prescribe the content and that there is flexibility in terms of the extent to which it is covered. It can be deduced that, only study areas with EE topics or content in their syllabus teach it while study areas without EE topics or content opted to leave EE compone t out of their lessons. It is worth remembering that before EE was made into crosscutting issue, it previously existed in ‘carrier subjects’ - Science and Social studies (now SSME) as topics. This trend has continued even after reforming the curriculum. Various studies have shown that when EE is included, it is most often an add-on in a science or social

studies methods course (Mosothwana, 1999; Jones, 2005; Beckford, 2008; Gough, 2009).

However, the status of EE in TS study area was not clear as some respondents claimed to teach it while others were not. TS study ar a consists of Home Economics (HE) and Industrial Arts as contributory subjects (CDC, 2000). HE was identified as a traditional subject where EE was taught (Kinyua & Murungi, 2002). HE focuses on health education and environmental health which are th social components of EE. Respondents teaching HE did integrate it in their lessons, however, respondents teaching Industrials Arts within TS study area did not. This observation in the researcher's view implies that there was no team planning and teaching among the study area members to ensure that EE was covered.

The failure by 42.4 per cent of the respondents to int rate EE in their teaching suggested that the policy of including environment as scutting issue in the two colleges had not been effectively implemented. This is in line with Gough (2009) who observed that despite many efforts, there is a rec ing testimony to the lack of success in introducing coherent or consistent programmes of EE in teacher education. Moreover, literature review on the provision of pre-service, EE revealed that where EE does exist in teacher training programs, it is more of a policy than a practice (Jones, 1996). In the two colleges, the crosscutting issue policy on EE was in variance with practice of implementing it, implying that the policy has been interpreted and enacted in a variety of ways. Instructional policy can be a challenge to practitioners (Cohen & Ball, 1990). While the polic might have influence on practice, the practice also has had a profound influen e on the new policy. Hence when teachers implement the policy, they do so in terms of their pre-existing practice, knowledge and beliefs (Mtaita, 2007). Teache s can frame the policy in terms of what they already know, believe, and do in the classroom (Cohen & Ball, 1990). In this study, respondents did not translate the policy into pra ce as they had limited knowledge and skills, and are used to speciali ation type of teaching. Moreover, when the policy was introduced, there was ne to provide support to teacher educators in terms of professional development and relevant resources. Otherwise, to the respondents, EE should be taught in SE and SSME. This belief and knowledge has a profound influence on their practice i ation to EE teaching even

in the presence of a policy. The truth was that, teachers of any subject can use EE to address general learning objectives (Fien, n.d.).

Meanwhile, the NPE has prioritised EE and public aware ess in all formal and non-formal education institutions (MTENR, 2007) but guidel for mandatory EE are not yet developed. This action falls short of UNESCO (980) recommendations on EE policies and general planning. According to UNESCO 1980), the aim of teaching EE will be fully attained only if the means required for the development of EE are explicitly provided for in educational policies and general planning. Lack of guidelines on teaching EE in the view of the researcher could also have contributed to non-inclusion of EE in lessons by the respondents. The for ulation of guidelines to ensure mandatory EE in formal institutions will definitely improve EE teaching in colleges since previously there was nothing that compe led teacher educators to include or teach it in the absence of environmental topic or content in the syllabus. State guidelines and standards have a positive influence on EE inclusion in many Teacher Education Institutions (Mastrilli, 2005).

5.2.2 The Priority of Teaching EE among College Teacher Educators

Only eight per cent of the respondents claimed to teach EE as priority in their lessons while the majority (92 per cent) did not. Given this situation, in the researcher's view, teaching EE was at the mercy of the individual teacher educator. This finding generally agrees with Russell, Bell, and Fawcett in Be ord (2008) and ECZ (2000).

If the majority (92 per cent) of the respondents did not teach EE as a priority in t eir lessons, it implied that they taught when they felt like teaching it. This signifies inconsistence in the way EE was taught and agrees with Palmer (1998), that EE holds nowhere near the priority position in formal edu on programmes around the world. However, this contradicts the NPE which outline that one strategy for implementing EE in the country was through mandatory EE in all formal and non-formal education institutions (MTENR. 2007). Moreover, EE was supposed to be a continuous life long process (UNESCO, 1986), but the results showed otherwise. Hence, there is need to revisit the implementation of EE in the two colleges and make it mandatory.

5.2.3 Area of Focus when Teaching EE

The results indicated that the majority (70 per cent) f the respondents focused on teaching EE content while 30 percent of the respondent focused on teaching EE content and methodology. The results further indicated that 'action for the environment' was not an area of focus by respondents teaching EE in the two colleges. These findings generally agree with Jones (1996) results which indicated that the action component is often missing from teache education programmes. In the researcher's view, this result confirms the respondents' view of EE where the majority claimed that it was about creating awareness about the environment. While information plays an important role in creating a climate of awareness, it cannot in itself offer instruction on the solution of the problem (UNESCO, 1980). EE should not only create awareness but also new pattern of behaviour in response to the environment (UNESCO, 1980; Le Roux, 2003; Beckford, 2008; Fien, n.d).

However, the above results differ significantly with what Mastrilli (2005) observed in his study about EE in Pennsylvania's elementary tea r education programmes. He observed that even with mandated standards, it seem d that many of the institutions surveyed did not place great value on content and pedagogy. Moreover, Mckeown-Ice's survey of formal teacher training programme for ence of EE training found that, in general students had limited access to EE content and methods (Powers, 1996). The results obtained in this study di fer with that of Mastrilli (2005) and Powers (1996) as the respondents in these two studie focused their teaching on potential environmental situations whereas the respond in this study focused their teaching mainly on historical environmental issu ording to the principles of EE, the focus of EE should be on current and potential env ronmental situations while taking into account historical ones and should help learners to discover the symptoms and real causes of environmental problems (UNESCO, 1980).

5.2.3 Methods Frequently Used in Teaching EE

The teaching methods frequently used in EE were question and answer, and lecture. These two methods mainly promoted teacher centred approach of learning. The frequent use of question and answer, and lecture methods ties well with MoE (1996), which noted that teacher training was promoting rigid cher centred methodologies. The college teacher educators spent mor time offloading knowledge into the students. In the view of the researcher, the teacher educator assumes the role

of an expert and fills the students with what he/she c nsiders to be important to the students. Students in most cases were passive and they only participated through answering of questions from the teacher educators. Thi type of participation in EE contradicted the principles of EE which recommended th EE should be student centred and teachers should allow students to contribute to planning of their own learning experiences (UNESCO, 1980). Moreover, the approach did not allow learners to view the environmental issues from a variety of perspective, apart from that of the presenter and did not develop critical thinking (UNESCO, 1986).

It is important to realise that Teachers' College clas rooms tend to be characterised by an emphasis on recalling and memorisation (Du pleus s & Mutafha, 2010). However, EE tends to undo the emphasis on rote learning by employing problem solving approach (Rao & Reddy 1996). Therefore, the fr quent use of question and answer and lecture methods suggest that very little pr ctical work was done by the students and most of the learning was in classrooms. However, UNESCO (1980) recommended that EE involves essentially teaching thro gh action.

Nevertheless, it was gratifying that a few of the respondents also opted to use demonstration, discussion, role play, field trips and oject methods. This result contradicts Mastrilli (2005) and Mosothwane (1999) findings. More than 70 percent of the respondents in Mastrilli (2005) commonly used d scussion, cooperative learning, inquiry and field trips teaching methods. In Botswana, the majority of the teacher educators in colleges of education employed field trips, then roup discussion, debates, while the least used method was project which accounted for 3.3 percent of the respondents (Mosothwane, 1999).

Discussion, role play, field trips and project methods cited by respondents if effectively used can lead to both acquisition of knowledge and development of skills and can further lead to change of attitude and ultimately to development of responsible behaviour towards the environment. These methods allowed students to focus on environmental issues from a variety point of ew thereby making them question the knowledge being presented (Mtaita, 2007). In the researcher's view, this was important in the formation of critical thinking sk lls and values necessary for action on the environment. EE is a subject that is of a very actical nature and is also supported by sound pedagogical principles (Rao & Reddy, 1996). Moreover, the

techniques used in its teaching should ensure maximum involvement of the learners and provide enough opportunities for students to experience the env ronment, whether actual or simulated.

The methods used in teaching EE also describe the form of EE practised in the two colleges of education. Question and answer, and lecture methods are linked to education *about* environment. Demonstration and field trip are associat with education *in* or *through* the environment. Demonstration and field trips make the students experience the issues in the environment. Project, discussion and role play contribute to education *for* the environment. This view is also shared by UNESCO (1980), Le Roux (2003) and Sytnik (1985). It was evident that the three forms of EE were practised in the two colleges although there was more education *about* and less *in* and *for* the environment.

5.2.4 EE Activities outside the Classroom

PMS was the major activity outside the classroom in which the majority (68 per cent) of respondents took part. However, respondents m oned that they also participated in production unit, clubs, and environmental days commemorations. These activities certainly are important in teaching EE.

However, what was interesting about PMS was that majority of the respondents in the two colleges were just involved in the end product students' work and not the process of teaching. This has created a negative attitude among the students who viewed PMS as purely manual work. Whilst respondents from TS taught PMS in their study area, the way it came out was mainly to provide information on what PMS was and who should do it. EE was used to create awareness and understanding about PMS among students and not necessarily to equip them with attitudes, values and skills required to carry it out.

EE should provide opportunities for learners to enhanc their capacity for independent thinking and effective responsible action (www.naaee.org). According to Jones (1996), development of critical and systems-thinking skills must be components of pre-service EE as these skills are necessary for students to understand the complex relationship between humans and the enviro ment, and to be able to critically analyse how their actions will impact the natural world. This view was also shared by UNESCO (1985). According to UNESCO (1985), EE should enable the

learners to have a role in planning their learning experiences and provide an opportunity for making decisions and accepting their c nsequences. During PMS students were not given room to engage in decision making but followed orders from supervisors (teacher educators). There is urgent need to target the attitude and skill development in students by teacher educators if PMS should contribute positively to EE in the two colleges. While it was true that PMS was contained in TS syllabus and was taught, it clearly fell short of what EE is about. If PMS was taugh to students, why did they continue to have a negative attitude towa it? In the researcher's view, this implied that just giving information about S was not enough as it did not allow for the students to act for the environment. This cannot be termed as full teacher educators' participation in EE although PMS was an excellent learning space for EE.

Respondents' participation in clubs and production unit accounted for 11 per cent and 14 per cent respectively. Environmental Clubs in the two colleges are supervised by a patron or matron and the rest of activities are e irely managed by the students. The patron's (teacher educator) role was to approve activities proposed by students and be the first contact person of the club to people outside the college. Rarely, college teacher educators present lessons on specific opics to club members. It is worth noting that while the club members (students) were actively engaged in EE through cleaning of the college clinic or solid management, dancing and singing, respondents did not participate in these activities. In view of this, it is quite difficult to say teacher educators teach EE through clubs but th presence of it in the two colleges can be attested by the activities of the clubs. One strategy of enhancing E and public awareness is through establishment of clubs (MTENR, 2007). Through clubs, individuals are involved in active problem solving process within the context of specific realities, relating what is learnt in classroom to community action (UNESCO, 1985). The presence of clubs in colleges of education agrees with Mosothwane (1999) who reported that in colleges of education in Botswana, there were environmental clubs whose function was to promote environmental awareness in the colleges of education community.

Production Unit was also used as a learning space for E in terms of awareness and participation. Students were taught how to produce agr cultural products and they actually participated in the production of crops and pigs. Furthermore, they also

participated in repairing of tables and chairs. Environmental day commemoration was celebrated through planting of trees. The responde s participated in creating awareness about deforestation and then in tree planting with the students. Through this activity the objectives and goals of EE were achieved and the respondents fully participated in the activities.

5.3 Challenges of Implementing EE

There was a clear agreement among the respondents that EE was not effectively taught as a crosscutting issue in the two colleges. Ac ording to Powers (2004) including EE in pre-service teacher preparation programs is a challenging ask. Respondents raised a number of challenges encountered n integrating EE in their lessons.

5.3.1 Curriculum is Unclear on EE

Unanimously respondents agreed that the college teacher education curriculum with respect to teaching EE was not clear. This was in line with Powers (2004), and Kinyua and Murungi (2002). The curriculum did not show the specific topics/content to be taught except a statement that EE was a crosscutting issue to be integrated in all study areas. This posed a challenge to respondents who did not exactly know what, when and how to teach EE. According to MoE (2001) EE has not been given adequate treatment in the past in the colleges' curricular judging by the manner in which it has been taught. While each study area syllabus has specific and prescribed topics and content to follow, content for EE was absent in some study areas.

However, according to Agrawal and Aggarwal (1996), much of the content of EE is found in other disciplines but in a non-environmental context. Therefore, the claim by the respondents that content was absent was incorrect as the syllabi had the content, all what was needed was the knowledge and skills to 'environmentalise' it. A major difficult in incorporating EE into teacher edu ation programmes is lack of shared understanding of what EE is (Beckford, 2008).This situation was easy to understand as it stemmed from respondents' lack of knowledge and skills in EE. According to European Commission (1998), the use of infusion model has an implication as curriculum documents do not necessarily prescribe the content. Therefore, using the infusion model, EE topics or contents are not included in the syllabus. The challenge that arises from this model is lack of scope and sequencing

for learning (Mastrilli, 2005; MoE, 2001). However, if the diffusion model is advocated, then there is need for separate topics and content to be included in the syllabus. A more practical initial strategy for incorp rating EE into the curriculum may be through integration into existing programmes ra her than a radical restructuring to incorporate separate EE courses (Powe s, 2004).

Moreover, respondents overwhelmingly stated that the c rriculum was overloaded and this made it difficult to integrate EE in their lessons. Teachers feel that the requirement to cover core content of key subjects such as languages, mathematics, science, and social studies must come ahead of cross-curriculum themes such as EE (Fien, n.d). With this background, it became difficult for the respondents to bring in EE in the already congested syllabus (Pandya, 2000; Kinyua & Murungi, 2002). When special school activities and class management issues are added i to the already busy routine of teaching, many could be tempted to feel that, as important as EE was, it is just one more thing to squeeze in (Fien, n.d.). Therefore, respondents opted to leave EE out of their lessons. Many authors have attributed failure to include EE in teacher education to an overloaded curriculum (Fien, n.d; Rao & Reddy, 1996; MoE, 1996; Beckford, 2008; Kola-Olusanya, 2008).

Meanwhile, respondents also revealed that the curriculum was examination driven and that they focused on teaching students to excel in the examination. This finding agrees with Bhandari and Abe (2001:5) in www.enviroscop.iges where it was observed that...

> "... existing curricular are book-based and examination-oriented. The curricula are not oriented towards a sustainable society ... classroom instruction is geared toward preparing for examinations, resulting in students who achieve high scores on final examination, but who have not developed skills and competency in the subject matter ... the pedagogy is mostly the ''chalk and talk' method and learning is ba ed on rote method and spoon-feeding (www.enviroscop.iges)".

Respondents spent most of the time 'drilling' the students to excel in examinations and when posed with opportunity to integrate EE, they felt it was a waste of time as EE questions were not included in the examinations. This observation ties well with Young and Lafollette (2009), results that students were not tested on nvironmental issues. In the view of the researcher, it implied that teaching EE by the respondents was essentially to satisfy the examinations and not th needs of society. However,

EE 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, 1980). Respondents were more interested in teaching contents that are examinable an not the holistic development of students. This is unacceptable and if not well checked would adversely affect the education system and society. The primary purpose of school is to serve society (Sandell *et al*, 2003) and, without appropriate knowledge and skills nts will not participate effectively towards resolution of environmental problems affecting their communities (UNESCO, 1980).

5.3.2 Lack of EE Policy framework and Guidelines

Another challenge that emerged from FGDs was the absen of a policy framework or guidelines both at national and college levels to guide the teaching of EE. Surely, if EE has to be implemented effectively apart from the syllabus, there should be a policy framework or guidelines. One strategy to enhance EE and public awareness was through development of guidelines to make mandator EE in educational institutions (MTENR, 2007). Unfortunately, the crosscutting issue policy of teaching EE has not significantly increased the amount of EE be ng taught as observed in this study. According to Jones (1996), EE recommendations and requirements are often put in place without corresponding guidelines. There is need as a matter of urgency to produce guidelines that should assist the responden s to implement EE. Moreover, each college of education should localise the policy t include local environmental issues or concerns. The literature review of the provision of pre-service EE revealed that where EE does exist in teacher training programs, it is more of a policy than a practice (Jones, 1996). It is through guidelines that the practise of EE would be enhanced. The existence of guidelines enhances EE implementation (Mastrilli, 2005). Many countries in the world have developed comprehensive national strategies for integration of EE in formal school curr culum (Mtaita, 2007). Therefore, MoE and MTENR should take up this challenge and develop guidelines on EE implementation.

5.3.3 Lack of EE Knowledge and Skills

From FGDs, lack of knowledge and skills by the respondents was yet another challenge encountered in teaching EE. In the view of t e researcher, as much as the respondents cited that the curriculum was not clear on what and how to teach EE, lack of knowledge and skills could have been the source of confusion. Teachers generally lack adequate understanding of how modern values and behaviour patterns are connected to the ecological crisis (Bower, 2001). E as a crosscutting issue has no specific topic but utilises the contents in a given discipline (European commission, 2008; Jones, 1996). If respondents had the knowledge, they could not have stated lack of topics/content as a challenge in t ching EE but how to integrate it using the current syllabi. Respondents were failing to make connections between their traditional study areas and sustainability. Anot er example to illustrate lack of knowledge was failure by the respondents to identify H V/AIDS as a component of EE. All study areas had integrated HIV/AIDS in their syllabi but when asked to mention whether the syllabus contained any environment l topics or content, HIV/AIDs was not mentioned as one of the topics. This arly indicated lack of EE knowledge by the respondents.

Lack of knowledge was not only restricted to what to teach by the respondents but also what EE was all about. Teachers require knowledge, skills, and commitment to 'environmentalise' their curriculum and produce enviro ally educated students (Fien & Rawlings, in Beckford, 2008). There is urgent need for te cher educators in the two colleges to be oriented in EE. According to Kola-Olusanya (2008), lack of knowledge may probably stem from the sense of ill-preparedness and low professional confidence with regards to their content and pedagogical knowledge of the current environmental issues and problems.

Another challenge cited by the respondents was how to each EE. It is unrealistic to expect teachers without expertise to explore environmental concepts with students (Beckford, 2008). The respondents acknowledged lack of expertise in integrating EE in their study areas lessons. While integration was th basis for the colleges of education curriculum implementation, it was strange th respondents cited lack of skills to infuse EE in their lessons. According to Mar owski *et al* (1990), infusion is a relatively simple process to understand, but a rather complex process to accomplish. Since the question of when and how to integrate EE was very prominent

from the FGDs, it implied that respondents had failed to infuse it in their lessons. No wonder, respondents clearly stated that EE should be t t by experts, the SE and SSME teacher educators.

5.3.4 Inadequate Time

Time was yet another challenge that emerged from the respondents that impeded teaching EE in the two colleges. This finding agrees with Mastrilli (2005). In his study of EE in Pennsylvania's elementary teacher education programmes, respondents suggested that there was simply insufficient time to comprehensively include EE (Mastrilli, 2005). The respondents in this udy explained that the timetable did not allow for inclusion of EE as there was no time allocated to teaching it. In the view of the researcher, this was quite inte ting as the respondents seemed to be quite confused about the nature of EE. In one br e, they accepted that EE was a crosscutting issue and should be included in all study areas, yet in another, they stated that there was no specified period for tea hing EE on the timetable. In view of the researcher, the respondents latently viewe it as a separate subject to be taught independently from other study areas and they e pected it to appear on the timetable as was the case in PTDDL where it used to st out as a separate module.

With this point of view on EE by the respondents, then time could be a challenge, but was it supposed to be timetabled as a separate sub ect? EE should not be a matter of 'competition' with various disciplines which are at present included in the educational plan but should be a means for promoting t e recognition by learners of a certain unity of the educational process and make it possible for them to develop the knowledge, skills and attitudes for preserving and improving their environment (Fien, n.d.; UNESCO, 1985). Again it is a question of ack of knowledge and not time. According to Fien (n.d.), "EE can become part of the curriculum without stealing time from other subjects because it is an essential part of the educational objectives of all subjects." However, a good number of researchers have attributed lack of teaching EE using infusion model to inadequate time (Syntik et al, 1985; Mastrilli, 2005; Rao & Reddy, 1996; Mosothwane, 1999; Beckford, 2008; Gough, 2009).

5.3.5 Negative Attitude of the Respondents

Although the attitude of the respondents was not explicitly stated from the FGDs and questionnaire, it can be implied from some sentiments made by the respondents. For example, respondents were quoted as saying, “It is ignored as it does not appear in the schemes of work,” or “It makes the teacher educator to opt to teach only those which are easy to handle.” In the view of the researcher, this seems to suggest that in spite of the knowledge possessed by the respondents, it was more of their attitude that impeded participation in EE. The teachers’ attitude is very strong militating against the actualisation of the goals of EE (Medayese 2009).

5.3.6 Ownership of EE in the College

Although this challenge was cited by a few participant in the researcher’s view, it deserves a lot of attention. If EE was not institution sed, its presence in the curriculum is at the mercy of one person and this leaves it in a precarious position (McKeown, 2000; Mastrilli 2005; Namafe, 2006). It can seen that if the implementers did not own the programme being implement , there was a greater chance of ignoring it. EE is usually viewed as a part of science education or as a separate subject and only rarely is it viewed as a basic underpinning of the curriculum or as a basis for curriculum integration (Jones, 1996). Respondents from SE and SSME study areas felt EE was their ‘baby’ while the other study areas did nothing to ensure that it was integrated as they thought it was adequately covered in these two study areas. EE was perceived by educators as being science based and often did not attract teachers from other disciplines es, 1996). The other study areas did not own or feel that EE was part of their work a d so they felt no need to teach it. Therefore, ownership of EE by every study ar is vital if it has to be effectively implemented.

5.3.7 Lack of Resources

Respondents also mentioned lack of resources as an impediment to teaching EE. Respondents complained about lack of reference material, transport and support from institutional management. Other scholars have mentioned lack of resources as a challenge to teaching EE (UNESCO, 1980; UNESCO, 1985; Kinyua & Murungi, 1999; Pandya, 2000). According to the principles of EE, effective EE uses a variety of teaching and learning resources (UNESCO, 1980). Inadequate or Lack of

resources resulted in lessons lacking practical activities and first hand experiences. Availability of necessary resources enhances the implementation of EE. According to Wilke *et al* (1987: 69) "the availability of resources influences t e infusion of EE. Where resources use is maximised, instructions can be anced and infusion facilitated."

5.4 Training Needs of Teacher Educators

In determining training needs of the respondents in the two colleges, their pre and in-service training in EE were investigated.

5.4.1 Pre –Service EE Teacher Training Programme for Teacher Educators

The lack of EE components in pre-service teacher training programmes for more than half (55 per cent) of the respondents as revealed in this study was contrary to the UNESCO recommendations for EE pre-service teacher training. According to UNESCO (1980: 87), "EE should be an obligatory part of pre-and in-service teacher education". Therefore, lack of EE in pre service teacher training for the more than 55 per cent of respondents affirmed that teaching EE was a priority in teacher education programmes. This was also observed by Jones (1996) in his study that teaching EE was not a priority in higher education. However, the possibilities of integrating EE into education programmes and the implementation of such programmes depend essentially on the training of the p el responsible for putting the programmes into effect (UNESCO, 1980). Therefore, there is need to include and strengthen EE in all pre-service teacher education programmes in Zambia.

Lack of or inadequate EE in pre-service teacher education curriculum has to be considered as a significant weakness given the ubiquit us nature of environmental concerns (Beckford, 2008). From the results, it can be impli d that without training in EE, respondents lacked the necessary competencies and commitment to 'environmentalise' their curriculum and to produce an vironmentally educated teacher. It is, therefore, not just sensible, but necessary to include EE in prep ration of teachers (Beckford, 2008). Furthermore, the findings generally agree with Agrawal and Aggarwal (1996) who stated that a great majority of teachers graduated from teacher training colleges when the importance of EE was not so apparent.

In another study in the USA, pre-service teacher training in schools of education across the New York State, with a few exceptions, did not incorporate environmental subject matter into their preparation programmes (Zamm, 2005). In India, it was also observed that there was lack of adequate pre-service training and environmental educators often have to learn "on the job" (Pandya, 2000). It can be deduced that teacher educators in general are not prepared to infuse EE into classroom teaching as can be seen even from the respondents in this study. However, it was gratifying that 39 per cent of the respondents claimed that their pre-service teacher training programmes did contain EE components. This is in line ith Gough (2009) who asserted that EE should become a pre-requisite component of teacher education and that faculties of education should make EE a teachable subject and expose all teacher candidates to it as a form of mainstreaming.

Results on whether respondents had or not received adequate knowledge and skills from pre-service training to effectively integrate EE in their essons revealed that some respondents from SE and SSME study areas had. Acc rding to Gough (2009), EE is integrative in nature. If EE was treated as a crosscutting issue, it was not only supposed to be emphasised during EE related topics but in all lessons. This strongly suggests that respondents from SSME and SE also lacked the necessary knowledge required to integrate EE across the syllabus. It is unrealistic to expect teachers without expertise to explore environmental concepts wi students to foster holistic, regional and global thought about the environment, rather than treating each topic or idea as an isolated, discrete entity (Stable & Scott, 2002 in Beckford, 2008). With this background, the need for teacher preparation in EE becomes more urgent in the context of lack of expertise and the generally narrow cus of EE teaching (Beckford. 2008).

Moreover, the results revealed that 61 per cent of the respondents who claimed that their pre-service training contained EE component confessed that they had inadequate knowledge and skills to effectively integrate EE in their lessons. The results also indicated that there was inconsistence between training offered and competences required in teaching EE in the two learnin institutions. According to Bowers (2006), many environmental educators are limited by virtue of heir own education to deal with the symptoms and are unable to help students understand the multiple ways of resolving environmental issues. There is urgent need to incorporate

EE in all pre-service teacher training programmes so as to clear the above inconsistencies.

5.4.2 In-Service Training Programmes

The results revealed that only 33 per cent of the respondents had received in-service training in EE. This situation revealed lack of seriousness attached to in-service training in EE and its teaching. The implication of such inconsistence in EE in-service training was lack of appropriate knowledge and skills to ensure effective integration of EE (Jones, 1996). However, training and professional development underpin what a teacher can accomplish in a school (Mo 1996). Inadequate in-service training in EE for the respondents had resulted in inefficient EE inclusion in the two colleges and further implied that there was a in the way teacher educators are trained in EE.

Figure 4.7 reveals that 64 per cent of the respondents' in-service training in EE was conducted by WWF and a few programmes by the two colleges (18 per cent) and Swedish International Development Agency (SIDA). While it was good that in-service trainings in EE were held, they were primarily ernally organised by WWF and SIDA. Only 18 per cent of the in-service training programmes were locally organised within the two colleges and this did not str en the government's policy on Continuous Professional Development (MoE, 1996). If the majority of respondents had not attended in-service training and pre-service training in EE, why did the colleges fail to initiate in-house training to strengthen EE in the colleges? Could it be the question of negative attitude on the part of respondents towards EE or EE as a crosscutting issue was not given the same recognition as other study areas? There is need to examine this issue in future as it will strengthen the position of EE as Colleges of Education were emphasising CPD activities. This situation suggested that there was no evaluation and monitoring of how EE s taught by both the college administrators and TESS to ascertain the effectiveness of the curriculum and approach used in its implementation. This has made EE be at the fringe of teacher education.

Subsequent analysis of the provision of in-service training in EE indicated that the period involved between EE in-service programmes for respondents was too long. However, EE requires special training and commitment because it needs a different

focus and outlook that many prospective teachers have ot experienced in their education (Tilbury (1997) in Beckford, 2008). The last training in EE was held in 2005 and the results reveal that only minority of the dents had knowledge and skills of teaching EE. Why was there no in-service training from 2005 to the time of this study to enhance the capacity of respondents in EE? This confirms that teacher preparation in EE is often sporadic (Sytnik *et al*, 1985; Filho and O'Loan in Beckford, 2008).

5.4.3 Competencies Gained From the In-Service Training Programmes

The results in Table 4.11 revealed that the majority of respondents gained only knowledge about EE though some respondents also gained competencies in community partnership and how to teach EE. A few also ained competencies in localising the curriculum, material production and management of PMS. This is in line with Sytnik *et al* (1985) who observed that in-service EE training is restricted to certain environmental issues. While it is appreciated hat all study areas had respondents that attended in-service training in EE except for EA, the relevance of the training was questionable as not all recommendable EE competencies were covered. Recommended EE competencies by UNESCO include ecology, conceptual environmental awareness, environmental investigation a evaluation, and environmental actions (UNESCO, 1985; Wilke *et al*, 1986; Agrawal & Aggarwal, 1996).

Analysis of the competencies gained by the respondents from in-service training all fell under conceptual environmental awareness competen y. In view of this, it could be concluded that in-service training in EE was ineffective as the competen ies gained did not explicitly influence holistic EE in the respondents' classroom practice. Meanwhile, respondents trained under WWF to be trainer of trainers in the two colleges, in the view of the researcher, failed to take up the chal e to train those who did not attend the training sessions in Kabw The cascade model of training teacher educators in EE should be revisited a d strengthened as it was ineffective as observed in WWF experience.

5.4.4 Training of Teacher Educators in EE

Without proper training, it becomes almost impossible effectively implement a programme which requires a given expertise. The unanimous response by

respondents to undergo training implied that they lacked the necessary competencies to effectively implement EE. Training of teacher educa ors has been considered as a 'priority activity' (Syntik et al, 1985; Gough, 2009). Moreover, qualified EE teachers act as stimuli to the introduction of EE into the school curriculum (Jones, 1996). However, which institutions should provide the training to the teacher educators? In addressing this issue, the long, medium and short term aspects of training should be considered. The long term solution will envisage inclusion of EE in all pre-service programmes. In the medium term, the University of Zambia should continue providing the postgraduate programme in EE to teacher ucators with relevant qualification. Those who will receive medium term training from the University of Zambia should in turn be trainer of trainers. The trained teacher educators in EE should utilise and take advantage of CPD to orient oth in EE as illustrated by Rao and Reddy (1996) through the cascade design of trainin er, every promoted teacher educator should be oriented in the teaching of EE before they take up their positions as teacher educators. This will imply appointment of an EE coordinator in the two colleges to oversee the inclusion of EE.

5.4.5 Specific Areas in Which Training Was Sought

The majority (56 per cent) of the participants claimed hat they needed training in all areas of EE. This was an indication that the responden lacked the required competencies needed in teaching EE. It was worth notin that, while some respondents picked content, methodology and material production as specific areas for training, these competencies on their own are inad ate compared to the challenges identified in Chapter Four, 4.4.3. The question that needs to be answered is what specific competencies should an environmental educator require in order to effectively implement EE to the learners? One way of tructuring an understanding of the competencies is to start from three main questions in education: *why*? – the motives of education; *what?* – the content of education; and *how?* – the methods used in education (Sandall *et al*, 2003)

These three questions can be translated into the found al competencies required by effective environmental educators and are broadly categorised into professional education and EE content (Agrawal & Aggarwal, 1997; Rao & Reddy, 1997; UNESCO, 1987; Sytnik et al, 1985). The competencies in EE content compri e ecological foundations, conceptual environmental aware ess, environmental issue

investigation and evaluation, and environmental action kills. Qualified EE teachers act as stimuli to the introduction of EE into the greater school curriculum (Martin, 2003).

5.5 Extent to Which Research Questions Have Been Addressed In the Study

The study sought to address the following research questions:

a. What are the views of teacher educators on the teaching of EE as a crosscutting issue in Zambian Colleges of Education?
b. How do teacher educators teach EE as a crosscutting issue in Colleges of Education?
c. How effective is the crosscutting issue approach used y teacher educators in teaching EE in Colleges of Education?
d. What are the training needs of teacher educators in Zambian Colleges of Education in EE?

In order to address the above research questions, vari us activities were undertaken to investigate the variables in the questions. Research question (a) was fully addressed in sections 4.2.1, 4.2.2, and 4.2.3 while re earch question (b) was adequately covered in sections 4.3.1, 4.3.3, 4.3.4, 4.3.5, 4.3.6, 4.3.7, 4.6.1 and 4.6.2. The research question (c) was comprehensively investigated in sections 4.4.1, 4.4.2, and 4.4.3. Lastly, research question (d) was wholly dealt with in sections 4.5.1, 4.5.2, 4.5.3, 4.5.4 and 4.5.5.

Chapter Six

Conclusion and Recommendations

6.0 Introduction

This study was set to explore the teacher educators' perceptions of EE and their participation in its teaching at Kitwe and Mansa Colleges of Education. The study employed a case study and was purposively conducted in two colleges. This chapter concludes the study and also presents recommendations based on the findings and discussion.

6.1 Conclusion

It was apparent in this study that in providing description of EE, the majority of the respondents emphasised creating awareness about environmental issues which is one of the international objectives of implementing EE. T acher educators' interpretation of EE was mainly on students' knowledge acquisition. It was also observed that respondents did not show concern for all aspects of the environment especially, the social, political, and economic aspects. However, it was seen that this view was limiting and inadequate in ensuring effective EE. It was suggested that EE should be concerned with not only creating awarenes but also developing knowledge, skills, attitudes, and values which are res nsible for effective care of the environment.

Moreover, it was evident from the respondents that EE was narrowly viewed to imply preservation and conservation of natural resources. This view also influenced their participation as EE was seen to be science education based. This view was perpetuated by the narrow perception of environment from the physical r ecological view. However, when teaching EE, environment should be perceived from totality perspective. The broader perspective of environment will embrace all study areas in two colleges of education to participate in EE.

From the results obtained in the two colleges, it was evident that EE existed as a main curricular and an extra curricular activity. As a main curricular activity, it was apparent that EE only existed as a crosscutting issue principle. In practise, EE existed only in SE, SSME and TS as these study areas had environmen al topics included in their syllabi. However, in all study areas the concepts of environment

was not taught as a crosscutting issue but 'caught by accident'. This indicated that the policy of teaching EE as crosscutting issue was not translated into classroom practice in the two colleges of education. Teaching EE as an extra curricular activity was through PMS, clubs, production unit and Environmental day's commemoration.

Teacher educators who participated in the study believed that EE was wrongly included in the curriculum as a crosscutting issue. This assertion could be responsible for non inclusion of EE by some study areas. The majority of the respondents who taught EE did state that it was not a priority in their lessons. This puts the position of EE in a very precarious position EE was left at the mercy of individual teacher educator. The majority of the few respondents who claimed to include EE in the lessons emphasised the teaching of content in their lessons. This assertion tied very well with the way teacher educators perceived what EE was about. It is evident from the study that EE was not effectively implemented as the other key goals and principles of teaching it were ignored.

This study identified that most frequently used teaching methods y teacher educators were related to achieving education *about* the environment. However, a few respondents made use of teaching methods related to achieving education *in* and *for* the environment. While question and answer, and lectu methods related to education *about* the environment, demonstrations and field trips were r lated to achieving education *in* the environment. A few respondents used project and discussion methods in their teaching. Therefore, it can be deduced that respondents were also trying to achieve education *for* the environment. From this perceptive, it could be concluded that all forms of EE were practised in spite of education *about* the environment was frequently used. With this background, there is need to reorient the respondents in EE to tilt it more to education *for* the environment as it tends to add relevance in the curriculum in which issues and problems within the community are expected to provide the context for learning.

The idea behind extra-curriculum activities is to enable holistic development of the learner and put theories learnt into practice. This study has shown that most of the EE extra-curriculum activities taking place were PMS, clubs, Environmental day's commemoration and production unit. It was unmistakable PMS was never used as an EE activity but as a way of maintaining the surroundings clean. Teacher educators

should use PMS, clubs, production unit and commemoration of special environmental days as avenues to act *for* the environment.

The respondents blamed their non-participation in EE in the lessons to unclear curriculum, lack of a policy, limited time, lack of knowledge and skills, lack of resources, and lack of ownership of EE as EE existed as a crosscutting issue. However, it was also discovered that negative attitudes by the teacher educators certainly contributed to the non-participation in EE. In short, 'resistance' to 'integrate' EE as a crosscutting issue approach at the time of t is study by the respondents at these two colleges was a complex issue. Therefore, the process of integrating EE became doubly difficult because it required changes not only within the college but throughout the TESS directorate.

The above account leads one to accept that the respondents had a huge task ahead of them and they needed reorientation in EE. Expounding to the challenges respondents faced in teaching EE, the majority of them had no training in the teaching of EE. It was evident that even those who had received some training were incompetent to integrated EE in their lessons. This implied that teacher educators urgently required to be trained to effectively implement EE in the colleges as teaching EE was purely learnt through 'job-on-training' basis.

This study also noted that all respondents unanimously needed to under training in EE implementation. However, they differed in the areas in which they need training. The majority of the respondents needed training in all aspects of EE. This request fits well with the challenges which the respondents have been facing in the implementation of EE in their lessons. Furthermore, th areas of training that comprise all aspects of EE are professional foundations of education, ecology, conceptual environmental awareness, environmental issues and evaluation, and environmental action skills. These competency areas should be the scope in reorienting teacher educators in the two colleges.

It was further noted that training of teacher educators in EE should be long, medium and short term. In the short term, training should be d by the curriculum coordinators in each college with the help of the coll ge administrators under CPD and provide the basics about EE integration using identified resourc persons with expert knowledge and skills in EE. In the medium term, those respondents with

relevant qualification should enrol for postgraduate p in EE to acquire the relevant skills and this should be focal persons and trainer of trainers upon graduation in the colleges.

6.2 Recommendations

This study has, undoubtedly given a catalogue of college teacher educators' perceptions of EE and their participation in its teach ng in the two Zambian Colleges of Education investigated. The recommendations arising from this study are three fold: recommendations to TESS and policy makers, recommendations for further studies and recommendations to the college management the respective colleges sampled.

6.2.1 Recommendations to TESS and Policy Makers

TESS and the policy makers have a greater role in determining the curriculum and monitoring its implementation hence, they need to consider the following factors;

- Since by policy EE is a crosscutting issue in the Zambian curriculum, an appeal to TESS, CDC and MTENR is to formulate guidelines on teaching EE. This recommendation is in response to the finding that respondents failed to integrate EE due to lack of guidelines. A specific policy on teaching EE will enable teacher educators effectively implement it. Just stating that environment is a crosscutting issue in the syllabus was inadequate in guiding teacher educators in EE. Policy and guidelines focusing specially on EE wou d define what should be done by the teacher educators.
- Environmental topics should be included in all study areas and not only SE, SSME and TS. This is in view of the research finding that EE was on y taught in SE, SSME and TS study areas which had environmental related topics. Environmental topics should not be centred only on social component but on all components of the environment.
- The Examination Council of Zambia should revisit the way of setting examinations for all study areas to allow EE questions to be part of the final examinations. This will enable all teacher educators to incorporate E in their lesson as it will contribute to examinations. This would address the research findings that respondents failed to integrate EE in their lessons as EE did not contribute questions to the final teacher education examinations papers. The

inclusion of EE examination questions would compel tea r educators to integrate EE in their lessons.

- TESS should procure various types of teaching and learning materials specifically for EE for distribution to Colleges of Education. This is in response to the finding that lack of resources impeded teaching EE in the two colleges. Materials sought included reference books and transport.

6.2.2 Recommendations for College Management

The college management comprises the Principal, the Vice principal, Heads of sections, Registrar and Accountant. To these stakeholders, I recommend that;

- The curriculum co-ordinators should help in coordinating EE in the colleges through team planning of the schemes of work and monitoring the implementation of the EE by each study area. Once in a term, Heads of Sections should meet and plan how EE should be implemented in that term. This is in view of the research finding that some study areas were not integrating EE in their planning and teaching. Moreover, there was repetition of work covered in SE and SSME study areas when teaching EE which created boredom in the students as the same work was taught to students at th same time by these study areas.
- College management should urgently conduct reorientation of teacher educators on integration of EE in the curriculum through in-house workshop. This would address the research finding that only a few responden s have had training in EE and that the majority of the respondents lacked the necessary knowledge and skills to teach EE.
- College management should make use of PMS as a learning space for EE. This is in response to the finding that PMS was only used as a way of keeping the surroundings clean without enabling the learners acquiring the necessary skills and attitude for effective environmental management. Before students are given any tasks, teacher educators should fully engage the students in deciding how the task will be executed. In short, students should be involved in decision making on issues of PMS
- College management should formulate a college environmental policy to ensure total integration of EE both in and outside the classr om. This would address the research finding that lack of EE policy and guidelines impeded EE teaching.

- College management should ensure that teacher educators join and belong to the community of EE teacher educators. This would address the researching finding that respondents lacked knowledge and skills on EE. Th ough networking, respondents would be availed with good practices invol ed in teaching EE.

6.2.3 Recommendations for Future Research

This research was a small scale evaluation of the teacher educators' perceptions of EE and their participation in its teaching at Kitwe and Mansa Colleges of Education. I strongly feel it could be useful to conduct further research using a larger number of respondents to shed light on the outcome of this study. The research could a so be done on:

- Teacher educators' attitude on teaching EE in the Colleges of Education.
- The role of CPD in the implementation of EE in Colleges of Education.
- The localising EE in teacher educators' institutions.
- The influence of extra curricular activities in EE implementation in Colleges of Education

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APPENDICES

Appendix 1: QUESTIONNAIRE FOR TEACHER EDUCATOR

Part A: General information

College……St dy Area / Section……

Teaching area (*subject within the study area*)……

Your position …… Gender: F M

Your professional qualifications (E.g. Certificate – Primary school teaching)

……

……

Programme you are teaching*: [Tick in the appropriate box below]*

- Certificate in Primary school teaching Diploma in Primary school teaching

Teaching experience in college, *Tick in the appropriate box*

Less than 5 years 5 - 10 years Above 10 years

Part B: The views of lecturers towards the teaching of environmental education.

1. In your opinion what is environmental education?

   …… ……

   …… ……

2. What is the status of environmental education in the C llege and in your study area?

   …… ……

   …… ……

3. Is the inclusion and teaching of environmental education necessary at pre-service teacher education level?

   YES NO

   Give reasons for your response

   …… ……

   ……

4. In your opinion is the inclusion and teaching of envir nmental education at primary pre-service teacher education level is appropriate.

   Wrongly included Not sure Rightly included

   Give a reason for your response.

   …… ……

   …… ……

5. Which study area/s should teach environmental education in the College? *Give a reason to support your response.*

   …… ……

   …… ……

Part C: Lecturers' participation in the teaching of environmental education

1. Do you teach environmental education in your lessons?

   YES NO *If you response is No, skip questions 2-4, and proceed to question 6*

If YES, what evidence is there to show that you teach Environm al Education in your lessons?

…… ……

…… ……

2. Teaching of environmental education is a priority in my lessons to students.
   Strongly disagree Disagree Not sure Agree Strongly agree
3. How frequently do you participate in environmental edu ation teaching or activities?

   …… ……

   …… ……
4. Which area of environmental education do you mainly concentrate on during teaching?
   Content Methodology Both Content and Methodology
5. List at least three methods that you frequently use in teaching environmental topics/issues to your students.

   …… ……

   …… ……

   …… ……
6. If your response is NO, in question 1, why don't you teach Environmental education in your lessons?

   …… ……

   …… ……

   …… ……

7. Is there any Environmental Education activities outsid the classroom in which you participate?
   YES NO

   If YES, list the activities in which you participate.

   …… ……

   …… ……

8. Environmental issues/topics are included in my study a a assignments and final examinations.
   Strongly disagree Disagree Not sure Agree Strongly agree
9. Suggest how you can effectively be involved in teaching environmental education in your study area?

   …… ……

   …… ……

Part D: The effectiveness of the approach used in the teaching of environmental education

1. Does your study area syllabus contain specific environ ental topics to teach?
   YES NO

   If NO, how do you decide what, when and how to teach environmental education to your students?

   ……. ……
   ……. ……

2. How do you ensure that there is no duplication of work taught in environmental education across the contributory subjects within the study area?

   ……. ……
   ……. ……

3. How do you ensure that work covered in other study are s in environmental education is not duplicated but complemented by your lesson?

   ……
   ……

4. In your opinion do you adequately prepare your students teacher to teach environmental education effectively at basic school where it's teaching is mandatory?

   YES NO

   Give a reason to support your above response

   ……
   ……. ……

5. Is there any mechanism that has been put in place to e sure that you teach environmental education in your lessons?

   YES NO

   If YES, specify what has been put in place to ensure environmental education is taught.

   ……
   ……

6. What challenges do you facing in teaching environmental education in its current form? List the challenge starting with the most pressing one.

   ……
   ……. ……

7. Suggest how best environmental education should be taught in colleges of education to make it responsive to the current environ ental issues the nation is facing.

   ……. ……
   ……. ……

Part E: The training needs of lecturers teaching environmental education in colleges of education

1. The pre-service teacher training programme which you undertook contained components of Environmental Education?

   Strongly disagree Disagree Not sure Agree Strongly agree

2. Is your pre-service teacher training knowledge and skills adequate for you to effectively integrate Environmental Education in your lessons to your students?

   YES NO

3. Have you attended any in-service training programmes in Environmental Education?

   YES NO

   a. Name the organisation/s that offered the training and when you were trained.

      …… ……
      …… ……

   b. Specify the teaching competencies which were developed in you during the training session.

      …… ……
      ……

4. Is it necessary for you to be trained or oriented in the teaching of Environment Education in the College?

   YES NO

   Give a reason for your response

   …… ……
   …… ……

5. Specify areas in which you would need to be trained or to enhance your effectiveness in teaching environmental education.

   …… ……
   …… ……

End of the questions

Thank you for taking time to complete this questionnaire

Appendix 2: LESSON OBSERVATION GUIDE

LESSON OBSERVATION GUIDE

College …… Date ……

Study Area …… Subject ……

Topic …… Class ……

Duration … ……

Activity	Parameter observed		Comments
Opportunity to integrate EIs in the lesson	Existed		
	Did not exist		
Integration of EIs in the lesson	No integration		
	Superficial		
	Meaningful		
Approached used to teach EIs	Crosscutting issue		
	Topic		
Planning of integration of EIs activities	Planned		
	Not planned		
Area of EE focus	Content		
	Methodology		
	Both Content and Methodology		
Use of the environment	Developing skills		
	Developing knowledge		
	Developing values		
	Others specify		
Outside classroom activities the lecturers participate in	Clubs		
	PMS		
	Others specify		

GENERAL OBSERVATIONS

……

……

……

Appendix 3: FOCUS GROUP DISCUSSION GUIDE

Activity 1- introduction

Welcome the members to the discussion and assure them that they should fully participate in the discussions and that information su plied will be confidentially treated and valued. Solicit for permission from the pa nts to record the discussion using tape recorder.

Activity 2- plenary

1. What do the participants understand by term 'Environmental Education'?
2. What is the position of EE in this College?
3. Is the teaching of EE a priority in the college?
4. What do you see as challenges of EE in the college/study area?

Activity 3 - conclusion

- Ask the participants for their perceptions and comments on EE not covered in the discussion
- Thank the participants for their active participation d then disperse.

Appendix 4: ***VERBATIM TRANSCRIPTS***

VERBATIM

Focus group discussion for Kitwe College lecturers

Good morning ladies and gentlemen,

Thank you for making it to this group interview or discussion. The discussion will is for about 30 minutes. It is a follow up to the questio aires which you all filled in and lesson observation conducted. The purpose of this interview is to create a common profile about your perception of environmental ucation and your participation in its teaching in this college as lecturer. For confidential purposes, I will be referring to you by your study area instead of your names. Please be as honest as possible.

Before we start the interview, I am requesting if it is possible to record on my laptop the discussion for later transcription as I won't have time to write your responses now.

So now can we form the EE profile by addressing the following questions?

What do we understand by the term environmental education?

ME: Um! It is the study of the environment and how we can effectively use it for the benefit of society.

Researcher: Thank you ME, others what is your understanding of EE?

SE: It is the dissemination of knowledge on the environmen . There is a relationship between human beings and the environment.

SSME: It is the study of the nature or the surrounding where different materials are found.

Researcher: Thank you SSME, others?

LLE: Maybe just to add on something, it is the acquiring of owledge on how we can sustainably utilise the natural resources of the e ironment. It is a sustainable way of using natural resources – acquiring the knowledge.

Researcher: Thank you LLE, is there any other explanations of what you understand by the term environmental education? Then us consider another issue.

Researcher: What is the position of environmental education in you respective study areas and the college? Any one of you can pick it up when ready.

SE: It is in all study areas as a crosscutting issue and i also exists as a co-curricular activity. Er.... say conservation club.

P.E: I would say its not there, for I have not even seen th clubs and dissemination of environmental education in any study area.....Like in my study area Expressive Arts.....right it is a crosscutting issue but we don't teach it. Maybe because of lack of information on what is involved in EE.

SSME: Yah it's in all study area like SE have put it. Umm ..... in PMS... we encourage planting of trees. Hence, silently it is in he College. But in SSME it exists as topics and we teach it to the students.

Researcher: What of in LLE?

LLE: Yes, in theory it is there like everyone has said except it is silent. In LLE we talk about, trees, soil etc. These words which we talk about are part of the environment. So it is there except it is very silent and with very little impact on the lives of students.

ES: We have it as a crosscutting issue as stipulated by the syllabus but it does not come out when we teach the educational topics. Usually we leave it out as there is no time. Probably it does not contain topics r content that can be taught to students.

ME: In mathematics, it does not come out in terms of content as such, but there is a component when we look at the aims and objectives of teaching mathematics. One of the aims is that the students should be able to apply the knowledge to everyday issues, and one of the things we talk about is that students should appreciate the environment. But I should stress that this is just done in passing.

Researcher: Can we say EE exist in the college and st eas at Kitwe College of Education?

LLE: Yes, it exists but as a by the way thing!

P.E: Yes, or not, as others have said the teach it but not in P.E it does not exist.

SE: Yes, it exists as a crosscutting issue and as topics i Science, and we teach it.

ES: In education studies it does not exist in any form and I will be lying if I said I teach it. I think and know that my other colleagues don't teach it.

ME: It is not something that we take seriously and teach.....Yes in the passing I do mention it and not teaching it.

SSME: It exists as co-curricular activity like SE said and also as topics within the syllabus. We teach it in SSME.

Researcher: How do you prepare the students to teach E school after graduating from here?

SE: In case of science, there is a component on environment and environmental issues were you find things such as pollution, waste management, depletion of the ozone layer, global warming .....greenhouse effect..... in our case we cover this...

SSME: In the SSME syllabus EE appears as a theme and it is taught to students.

P.E: Err.....lack of knowledge has contributed not teaching it but we have topics such as story games, singing games in which information of EE can be taught. Moreover, our concentration has been on drug abuse, child abuse, HIV/AIDS, Health aspects that is things that are promi nt in society. But ..... could these be part of EE I wonder? .....if there is sen itization we can also teach it.

SSME: In Zambia, we have a problem where we are preparing ou students teachers to go and teach what they are not taught in college. In Ireland students are taught what they will go and teach. The way we teach about polluti n is not EE.

Researcher: Is teaching of EE a priority to you?

SSME: No really because EE comes out as crosscutting issue. f it was a priority is should have been a separate study area. I only teach it when it comes as a topic. Otherwise, when it's not appearing in a topic, it is not mentioned and if by any chance it is mentioned it's by accident.

LLE: But I think for us in languages there was this workshop where we tried to integrate environmental education into languages and it worked as everything found in the environment is found in language that is litical, social and economic. Despite the workshop it's difficult to meani gfully integrate EE when it has no specific content.

Researcher: Can you say that teaching EE is a priority?

LLE: No its not we just use the terms that are found in EE.

ME: From mathematics point of view, I wouldn't say you can find EE in the syllabus stated as a topic or content. It just depends on a particular lecturer how he/she understands that particular aim or objective of te ching

mathematics... Why he/she teaches mathematics ... then he/she will bring EE issue as an example. In mathematics it depends entirely on a particular lecturer, hence it's not a priority.

ES: It does not come out in Education studies. There is no policy to encourage the teaching of EE in education and I think in all study areas in the college. So ... I can't say it's a priority to me if not a burden. I d n't teach it when I am supposed to.

SE: On the question of seriousness, there was a time when WWF held a workshop on the use of EE manual for lecturers and the t the manuals. It could be that many lecturers have moved out of the college and many new lecturers have come in and they are not inducted on teaching of EE?

Researcher: How many of you did attend the said worksh p organised by WWF?

It's only SE who attended it!

LLE: In future as a policy, the Ministry of Education should make it as a separate study area for it to receive the attention it deserves.

Researcher: What do you aim to achieve by teaching EE?

SSME: The goal is to fulfil the requirement of the syllabus. to create awareness about environmental issues. Mainly it is just to make them be knowledgeable of the current environmental issues taking place in the world...or example, climate change and pollution.

SE: In science my..., I mean... our goal is to make students aware and conserve the environment.

Researcher; that is interesting but do you go further o make students act for the environment?

SE: Oh No! We concentrate on preparing them for the exam, e can we find time for that? It is only hoped that after acquiring the knowledge then they can go and conserve the environment later.

SSME: Yeah...the environmental club members do that. Last time they participated in keep Zambia clean campaign by cleaning the Mindolo clinic. Even PMS is part of acting for the environment but not a lecturer aking students out from the classroom.

Researcher: What is the effect of using crosscutting issue approach in teaching EE?

SE: There is serious repetition of work taught to students e.g. Science Education and SSME both teach climate change and pollution. Worse still these are taught almost at the same time.

SSME: Repetitions bring in monotony e.g. pollution is taught in SE and SSME. So students feel we waste their time. In fact most of them tend to stay away from classes when this happens.

P.E: Uh …..... competencies! It makes lecturers opt to teach only those which are easy to handle such as HIV/AIDS were every lecturer was trained. EE is more complex as it is more science based and to some of us, science is our 'in-law'. It won't be taught by incompetent lecturer like ! For without training I wouldn't want to show my ignorance to students.

SE. I think another challenge is in setting of questions f the examination. EE has not a standard reference point ... I mean content o base the examination questions on, how do you know what was covered or left out as it is left to individual lecturers' discretion whether to teach it or not.

ME: Please don't be so negative! On the positive side, if very lecturer was talking about environmental issues, it will carry more weight nd it might contribute to attitude change and improved environment.

LLE: Have you ever heard about the tragedy of the commons? f no one owns something there is no care so is EE. So long as it is a common issue, lecturers will always expect the other study area to teach it and in the end it will die out and only remain in study areas where it is a topic.

Researcher: How should teaching EE is done in colleges of education?

SSME: Maybe as LLE said, when we were in tertiary institutio I think the issues of methodology was left to one group where everyone goes, even EE should be designed in a way that only one group should be covering it. .... Moreover ....lecturers tend to avoid teaching subjects that are not examinable. So it must be included in examinations.

LLE: Lecturers are not competent to handle EE. We need comp tent lecturers to handle it and not everyone otherwise people will shun t. So SSME and SE can take it up or still stand as a study area on its own.

Researcher: Won't making EE a separate study area make the curriculum overloaded?

SSME: (Strongly) No! The crosscutting issue approach enhance monotony cause by repetitions and but a separate study area will improve its teaching

LLE: It is worth noting that all crosscutting issues are pa and parcel of EE, therefore making it a subject or study area will improve its teaching, status and impact in the college.

P.E (Quite strongly) As much as we are all required to be lved in the teaching EE, I am with the view that they should be a particular study area where it should really come out or stand out as a study area or component where it should be taught and when it comes to examination time there will be questions to adequately cover the subject.

Researcher: Welcome AD to the group interview where we are trying construct the college's profile on the teaching and perception of EE by college lecturers. What is the status of EE in your study area specifically Art and design?

AD: Thank you but I'm sorry to come late l had to attend t other official duties outside the college.

Usually most of the topics that are taught in art and design are divided into natural and artificial. And we deal with 50% with the tural environment. The environment most of the times is the source of exa ples.

EE deals with bringing learners to be conscious of their environment which they are supposed to take care of. One thing we do impart in them is appreciation for the nature. Once they develop the ability to appreciate what they see, even things they view as dirty can be turned into useful things.

Researcher: What are the major challenges that you face in the teaching of EE as a crosscutting issues?

A&D: There are no resources e.g. books to assist us integrate EE in the lessons. If what is taught has to be meaningful, then there is nee for resources books and financial help to enable us research, plan and teach EE effectively. Moreover, we need training in EE as EE is an emerging concept.

Any other relevant issues that you would like to bring ut which as not been discussed on the way you teach and perceive EE in the ege?

Long silence....!.

Then ladies and gentlemen we have come to the end of the interview. I would like to thank you for your active participation in the discussion and as I assured you this

discussion will be not be exposed to other authorities apart from those in academic circles. Thank you and stay blessed.

HEADS OF SECTION –KITWE COLLEGE OF EDUCATION

What do you understand by the term EE?

SSME: It is the study of issues that are related to the envi onment meaning the surrounding where we are live and interact as human beings and all issues related to the aspects in the communities where we live in.

EA: Err ... I could say studies concerning the protection, sustainable use and recreation of the environment.

TS: I think it is an education that is acquired through th study of the environment and the activities that take place and how to take care of certain measures to prevent certain.... Er.... phenomena from happening such as issues to do with gender; safe life skills just to mention a few.

ES: EE is the way we are supposed to look after our enviro nt as a college in relation to what is in the college and the way we can ain whatever we have. I mean the way we can care for the things we have in t ollege.

Researcher: Having defined EE, what is the position of EE in the college and respective study areas?

ME: We are trying to keep the place clean. What I'm saying is that the position of EE in the college is sound in the sense that we have sensiti ed the students to keep the place clean , er ....on the co-curricular side and in the classroom activities.

ES: We have gone a little further by involving students in PMS ..... that is cleaning the surroundings.

EA: (Quite confidentially) I will take this position EE is not taken as academic I mean a course independently. It takes a position of a sscutting issue and it is taught across the curriculum both as curricular and extra-curricular activity in all study areas. Study areas lecturers tackle it as a crosscutting issue, in SSME and science there are topics while EA looks at it in another way. EE as extracurricular or co-curricular is done through PMS and in others activities such as clubs for example cultural, and Conservation. So in EA it is not a topic just a crosscutting issue.

Researcher: It is interesting that all of you have mentioned PMS, you teach the students why the carry out certain actions during PMS?

TS: (Quite faintly) I will answer that one; in TS we teach them why PMS is supposed to be done.

ES: Usually it is never explained to the students to why t e doing the work and the just take it as manual work and routine activi Students seem not to understand why they carry out PMS; no wonder the negative attitude each time there is PMS.

TS: They are taught in classroom, but when they go in the to work they do the opposite.

EA: I don't know where we have gone wrong as students do not change their attitudes towards maintaining the environment. They throw litter anyhow; classrooms are not swept in time. Yeah I accept studen s have such a negative attitude towards PMS.

Researcher: Is teaching of EE a priority to you in you lessons? Give a reason

SE: Teaching EE is not a priority. Er.... I mean, because is a crosscutting issue which is left at the mercy of the person teaching it. In science it is only taught when an environmental topic appears in the schemes of work. Er.... probably it has to do with policy! There is no policy to promote teaching of th subject or area and I think as a college we have not taken it seriously. I think it's not a priority because there is no policy to reinforce its teaching.

SSME: You know it's like the college takes Er.....er....EE as an extracurricular activity. It has been left to individuals to decide whether to teach it or not. At times I mention it in passing, but it only becomes a p ity when environmental topics appear in the schemes of work. So it's not a priority though we teach it. Lack of policy has contributed to s situation where EE is not taken seriously. I think this due to attitudes that have been changing from way back and now it has gotten so serious that you cant tell whether there is EE or not.

EA: Apart from being no ones' baby, EE is not examinable. mean because we want to rush in teaching the students and we want to teach what will come in the exams, Er .... and you know education has become e amination oriented so it is left out and is not taken as a priority. Only those things which are examinable are taken as priority.

ME: The curriculum for mathematics is too theoretical and ot flexible to allow for other components such as EE.

Researcher: Thank you ME but explain further what you mean by that statement

ME: (STRONGLY) Mathematics syllabus is broken into specific topics and content .....umm... and the contents for EE are not included. So how you do expect me to prioritise teaching something which does exist and I have no knowledge to the extent it should be included. Remember we hav time in which the syllabus is supposed to be covered otherwise they will be massive failures. I wouldn't want to receive the blame for teaching other things that won't be part of the examination and is not part of the syllabus.

SSME: There is no policy and the will from both the Ministry of Education and lecturers to incorporate EE in teaching. The Ministry pposed to include it in every study area as content and not just as a st tement that environment is part of the syllabus – um..... crosscutting issue. Like I said it earlier we only teach EE when it appears in the scheme. Um... we ack the knowledge and skills to teach it. You know integration is a new pproach which just came up with ZATREP or ZATEC and it was not part our pre-service teacher training..... Sorry I mean my training for I can't spe on behalf of others. Lack of knowledge and skills about EE and its integration is also hindrance to its teaching.

ES: Wow..... It's funny, coming to Education studies nothing has been mentioned in the syllabus about EE and the syllabus does not contain topics or contents of EE. So we don't teach it.

EA: In EA we try to teach it whether by design or default. But the syllabus is silent about the topics or content. It's only the nature of EA that makes us include it by accident mainly not by design. We teach bout paper *marshal* where students make use of waste papers to make something. This involves recycling but we don't it teach it our concentration will be on the product. Maybe in music section where traditional songs and dan es are performed.....? The emphasis of EE is left to individu lecturer to include it.

ES: Do students realise that what they are learning is EE n EA? Could this enable them go and teach EE effectively in schools?

EA: I have never asked them but it also contributes to tea ing EE silently.

SE: In SE, EE is taken as a priority as it is very close to science. So we have taken it seriously and teach it as topics within the syllabus.

TS: Some EE topics are very close to TS. Because in TS tha is both in home economics and Industrial arts we look at the health of the environment. But we don't take it as apriority as already the syllabus too full that we can't put other issues in it. We only teach what is contained in the topics such as health education and reproductive health.

Researcher: What is the main goal of teaching EE in your lessons wh her by accident or design?

SSME: In SSME, we teach the responsible use of nature and resources that are provided by God. We also try to look at issues of prot ction and those aimed at making people to appreciate nature and utilise the esources prudently. In short we aim at creating awareness and empowering the tudents to make right decision about the environment.

SE: Err....Like in SSME, the issue of the environment is very important because it is the home where we live. We teach the students to be aware of the fact that if they don't look after the environment well, it will get destroyed and ultimately human beings. Basically, er ... I'm saying after creating awareness it is hoped that students will change their attitude t wards the environment.

EA: EA is very wide but our focus is on the use of environment as a means to enhance our lives. Umm...For example drums are made from trees and animals so both trees and animals need to be protected. In art and design we teach about drawing of nature, while in P.E we teach a health living. So basically we teach environmental awareness and responsiveness.

Researcher: What is the effect of teaching EE use a crosscutting i sue approach?

ME: It's very difficult to know whether the students are getting what is taught as there is no evaluation of what is taught. Everyone ass that the other study area is doing it right, even though they ignore it. Moreover, it's impossible that are all study areas can effectively incorporate it in their teaching. Like in mathematics it quite difficult to in egrate it meaningfully.

EA: Some study areas don't have specific topics to teach so how are they going to teach it? In most cases it is not effectively covered s we assume those study areas with content or topics. Ownership is not there, o it's neglected by lecturers with little or no knowledge or skills about it.

ES: If I am forced to teach what I don't know ..... and I don't even know the depth of what I am suppose to teach , I will simply i nore it. To me EE is

just an extra burden as already ES is overloaded. So the best is to let it stand out as an independent study area.

SSME: It should only stand out on its own because when it is integrated like at present, its value is diluted. It becomes a by the way thing like EA said, there is no ownership. Moreover, there are clashes that aris due to differing competence among the educators. Other lecturers will openly discredit their fellow lecturers for divergent views taught to student thereby creating friction within the institutions.

SE: EE calls for teaching across study areas and we are no prepared to teach across the curriculum due to our initial training. Lecturers find it difficult to team teach and plan due to specialisation. ..... Sci nce teaching with LLE.....? So in the end EE just remain a white elephant.

ME: There are no resources to use, and lecturers end up just telling stories instead of being practical.

SSME: Even us who teach EE, there is lack of resources. There are no prescribed resources to use in EE.

SE: Err.....the administrators don't usually provide support. Last time we were teaching on mining and we need transport to take the studen to the mines for a field trip but even when the resources were avai the trip was cancelled at the last time. There is need for moral and material support from the college administrators.

TS: Syllabi are too wide and examination oriented, which make it almost impossible to fuse in others things. Moreover there are too many students at times it becomes difficult to carry out certain thing such as field trips.

Researcher: Are there other challenges that you feel has not been included in the discussion about the teaching of EE and the way you perceive it?

Then ladies and gentlemen we have come to the end of the interview. I would like to thank you for your active participation in the discussion and as I assured you this discussion will be not be exposed to other authorities apart from those in academic circles. Thank you and stay blessed

HOS FGD - MANSA COLLEGE OF EDUCATION

Researcher: What do you understand by EE?

ES: It's a way we expose ...I mean educate our learners on the... er... sustainable use of our physical environment so that our present ne ds don't compromise those of the future generation.

LLE: it's the type of education that looks at the environment ...umm... nature and issues on how to take care of the environment, ... how to sustain it or improve it.

TS: It's looking at the value of the environment to us as n beings for our existence. Everything hinges on the environment and its importance. So it is included in the curriculum.

Researcher: Is it necessary that EE be incorporated in the curriculum?

TS: Er....like I have just said, it is and it is always th re. This is how we have seen that when we look at the curriculum, the way it has be n formed and framed in the curriculum. It has been designed according to the level and demands of the recipients of the knowledge. It does not come out ecifically as EE but the ideas that are taught hinges on EE.

LLE: I think it's important because like human beings some the things we do, we do them because we want to do them... Because we don't know the harm or badness that is there awaiting us. But with education, we will understand things better and do them better. Another importance w en EE is included in education, teachers are agents of change, they will help in educating the community where they will be found and as a result there will be reduction on the abuse of the environment.

ES: An example, here in Luapula, there is an understanding that fish is not limitless and I think it can be used in school to teach what environmental mismanagement means.

Researcher: What is the position of EE at Mansa Colleg f Education?

LLE: Yeah, in LLE it has not been given the importance that it deserves as it comes under the component crosscutting issue. Um...and normally what is talked about are just ... you know...I couldn't say are basics...mm...just in passing.... by the way. So it is not pronounced or emphasised.

ES: We don't even mention it, and if it is mentioned then is accidental. It is not in the schemes of work and in the syllabus.

TS: It is not mentioned as a component on its own but as infused in other existing knowledge or topics. For example ...er ...how to dispose of litter vandalism,

importance of having latrines. That is basically, how it is taught but it does not come out as per say as EE. There just topics or co ent scattered within the topics.

Researcher: Welcome ME; we were just discussing the position of EE in the study areas at MACE. So what is the position of EE in ME?

ME: Currently in Mathematics, we are doing it on a very small sc usually when preparing questions on statistics. But we don't teach because it does not appear as content in the syllabus.

LLE: In LLE, it's not a topic but just a component under a topic crosscutting issue. So it is just a by the way and sometimes it is even skipped because it is not so important.

Researcher: Is the teaching of EE a priority in your respective study areas?

ME: EE as I mentioned earlier, it is not in the schemes of work nor syllabus but of course at times we integrate HIV questions. It may onl appear as a question but we do not teach it to students. So it's only applied in questions.

ES: But I think in Science and SSME, EE is a major topic. In SSME, I remember we had it in from religious, social and scientific views of the environment.

TS: Er... It is very difficult for me to say it is a priority or not because it does not stand out separately and it all depends on the topic which is being taught. So it is not something that you teach in very topic ...er it's not a priority.

LLE: Mmmm... as I said earlier, at times we even skip it, how can it be a priority?

Research: From the discussion what is coming out is that you teach EE as by the way thing. So what is your aim of teaching EE when it is taught in whatever form?

TS: It's to create awareness ...er...for example when we are teaching on timber, we emphasise the conservation and continuity of the resource. And most of these are done theoretically, we will teach about conservation but we won't plant any trees.

ME: When I examined your questionnaire, one way I was look ng at the environment, I was looking at PMS and Pollution.

Researcher: Are students taught the importance of carrying out PMS activities?

ES: As far as I am concern, in most cases there are just given tasks to do, the only thing that we or I do is to supervise them. That is to see whether the task is done satisfactorily.

LLE: (Quietly) I personally do educate them especially when I see that their attitude when work is given is bad, except I don't gather and teach them the importance of participating in physical work or in cle ning the surrounding. When I teach it's to change students attitude.

ME: When I supervise the students, I assume that they know and there is no need of teaching them. But coming to your question, the rea on why we include the EE in question is to see if students are able to apply the knowledge learnt.

Researcher: What Challenges do you encounter in teaching EE as a crosscutting issue in your study areas?

ME: It all begins with the curriculum itself which is not lear per se. There is nothing apart from the statement that crosscutting iss in this case environment should be taught in every study area. So how do I tell what to teach and when to teach? In short, the curriculum is not clear on what we need to include mathematics.

TS: Er ... EE is taken as more like an extra curricular ac ivity. We have a club dealing with EE and students will learn more from EE c ub when they join it. So we leave it out in our teaching.

ES: Sorry I am getting a bit confused, what type of EE are we looking at? Why shouldn't we leave EE to specialists like SE and SSME? We are not specialists.

Researcher: Welcome EA and SE to the discussion on the teacher edu ators' perception of EE and their participation in its teaching in colleges. Please feel free to participate in any way possible as your contributions matter a lot. What is position of EE in you study area?

EA: I can confess that we don't emphasis the teaching of E in EA. If other lecturers are doing it, then I am not aware of that as EE is not included in the scheme of work. In fact even in the lecturers' teachin files I have not seen any thing to do with EE. But at times we give students an assignment to draw a tree; if this is EE then we teach it.

SE: In science, it appears as a major topic and included in the syllabus and schemes of work. When you look at EE it is more inclined to Science than

any other study area though it is a crosscutting issue. In other study areas it has not come out so clearly the way it comes out in sc ence though even in SSME also is clear. For us we go directly hammering on it as it appears in the syllabus.

Researcher: What is you goal of teaching EE in your le ons?

SE: The main goal is to impart the knowledge about the environment, environmental risks and the same knowledge and skills n be passed on to children in schools later.

EA: You mean when we ask the students to draw a tree or any thing in the environment? We mainly use it as a means. I mean a source of material for learning but also as way of making students appreciate it.

Researcher: Thank you SE and EA very much but let us get back to the challenges encountered in the teaching of EE.

TS: In designing of EE you will find that those at the top...er... officials from CDC and Ministry of Education will say every lecturer hould teach it. Unless it is developed and the curriculum is passed to everyone so that they are oriented on how it should be done. We have so much taken in by following the topics in the syllabus... what we are supposed to cover ... the body of content! So in certain syllabuses the body of ent in EE is a bit silent and it does not come out clearly to say include EE. This has made it difficult to teach it. It is left to individual lecturer with the will power to include it or not as study area does not plan it.

ME: In addition to what TS was saying if we are availed with the whole body of content (EE) especially the syllabus it will help. If t was EE syllabus or content available, somebody may say I think this may fit in my section.

SE: The other challenge is the lack of reference material. When you look at the concept itself, it is an emerging concept and not enough material is available. For us who are teaching it, we find it difficult to get the reference materials. Last time I was teaching on Education for sustainable development and there is no single book referring to it in the whole college.

LLE: I think the main one challenge is the curriculum which is not well defined so it's not helpful. Mm....you have to use your initiative and decide on which elements you need to cover under environment. Definite y if the syllabus was well defined then maybe the resources wouldn't be much a problem, because,

when you know what you are supposed to do, then you will know w will help you teach effectively.

Researcher: Do you have knowledge of EE?

LLE: Maybe we don't have adequate knowledge in the first pl e. We don't know what should be covered in EE. But we know what EE is and what a crosscutting issue is! We are not blank. We have an idea but what exactly should be talked about under each study area is a chal ge.

TS: This is the reason why there are many problems pertain ng to EE. For example, the perception of all lecturers is that the experts of EE are our colleagues from Science. They are the people who are c nversant with the issues in EE. So much that it is even included in the yllabus for them.

ME: In addition, if somebody is asking about knowledge and skills of teaching EE, I confess, I am surely incompetent in this area.

ES: When it comes to integration we are talking about integration across the study areas, the challenge is where do we integrate it? In ES where do you bring in EE? What aspects should you be able to bring out that should reflect that at this point I have integrated EE?

EA: Time is also another challenge we encounter. Each study area has specific topics to cover and those topics are supposed to be covered in that stipulated time that is nine terms. Introducing in EE will mean we won't have adequate time to complete the outlined content which will come nd affect the students at the end.

LLE: I think another challenge is in setting of questions in the examination. If there is not a standard reference point ... I mean the content on which to base the questions. How do you know what to include in the question paper as there is no uniformity in what is taught in EE and teaching is eft to individual lecturers' decision?

SE: Another challenge is lack of policy on the teaching of EE in college. Just o say it is a crosscutting issue is not sufficient. It does not give adequate guidance because even in science we only teach it when appears as a topic. Before I forget in science, it is also difficult to organise field trips due to lack of resources and high number of students available. Fo example where can I find transport for over 300 students, if I want to tak them to see the poor fishing methods employed in Samfya?

ME: I think our current syllabus especially mathematics which I teach, it is so overloaded that there is no room for more work. Even if I was trained and have the necessary knowledge and skills, reference boo are available... mm... I think it still won't be possible to include EE. If we fail to complete teaching the work in the current syllabus how possible is it that we can dare to include in more work and finish teaching it?

Researcher: Are there other challenges that you feel has not been included in the discussion about the teaching of EE and the way you perceive it?

Then ladies and gentlemen we have come to the end of the interview. I would like to thank you for your active participation in the discussion and as I assured you this discussion will be not be exposed to other authorities apart from those in academic circles. Thank you and stay blessed

LECTURERS: MANSA COLLEGE OF EDUCATION

Researcher: what do you understand by EE?

LLE: In my view it is the study of the environment and how to conserve it.

ME: It is the study of environmental related issues such as water cycle, carbon cycle, and the interdependency between living things.

SE: Wow! I would say it is the study of the environment an how to take care for it without putting undue pressure on it.

HE: The study of the environment and the care for the environment...er... and how people behave towards that environment.

ES: Awareness about environmental issues.

Researcher: Thank you all for your responses, now what is the position of EE in your study area and the college in general?

LLE: It is mainly covered in science section and not in LLE.

SE: Although it may look like it's a component of science is a crosscutting issue. Every study area and lecturer should teach it. Mm...including LLE!

LLE: We also have an environmental clubs which looks at environmental issues. It's not a study area or subject in the college. But I remember for those in-service teachers under PTDDL programme it was a separate module...module 5.

SE: Basically in science we give it some attention as it is found in the syllabus as a topic. Moreover, as we handle other topics there is so a chance to teach environmental issues. When we are dealing with mining we will deal with

risks that are there, land issues, Natural resources e c. So you will find that as you teach all the topics there is an opportunity to refer to EE. But as a crosscutting issue we don't give it much of the attention it deserves.

ES: In ES the issue does not come out quite clearly though it is integrated here and there according to the lecturer as it is not reflected in the schemes nor syllabus. For example when we are teaching about the use of the local resources in primary school, the environment is used a a means to get the resources from. In addition we also talk about localised curriculum.

ME: As I have already mentioned in mathematics it is not a big issue, we don't teach it but at times we apply its concepts in assessment.

Researcher: can you elaborate further on your statement!

In statistics we bring in issues of pollution. Uh.... ask the students to draw graphs based on the amount of waste litter found in th college. It's more of application than actual teaching.

H.E: It does not come out clearly but it is infused in othe topics across the syllabus for example in home education, there are aspects of EE.

Researcher: Whether you EE teach as a topic or infused in a topic r apply it in questions, what is your main aim of teaching or including EE in your lessons?

SE: Basically to create awareness about the environment.

ME: To assess if students can apply the knowledge learnt t environmental issues.

ES: Mainly to develop positive attitudes towards the envir ment so that they can live sustainably.

LLE: Environmental issues have a way of life and a common trend so students should have knowledge about it as they are affected by it.

HE: To make them appreciate the importance of the environment through participation in general cleaning activities.

Researcher: What challenges do you encounter in relation to teaching EE in your study area or college?

ME: We have limited knowledge about the environmental educ and issues. So how do you expect a blind person to lead another? I is suicidal! So we avoid it.

H.E: Even materials! There are no materials to use to help nd guide us to teach EE. Moreover it does not come out clearly in the syllabus. I mean the syllabus does not show exactly the content to cover.

ES: Even when you are teaching it, there is no limit to what you can teach as there is no content to guide. It's difficult to know the extent of the content to cover in each study area and topic.

LLE: there is limited knowledge to enable us integrate it i our lectures. Coupled with lack of knowledge, we have also not taken up any tep to plan as study area how it can be implemented. So I can safely say even our negative attitude as lecturers were a challenge for we all know that it is a crosscutting issue.

SE: Basically, the challenges can be found in everywhere even in science though there are topics in the syllabus. The high student enrolment makes it very difficult to use field trips that require a vehicle. Time is also limited to bring in EE in other topics not related to EE as education i examination driven. We focus on preparing the students for examination not live or work they will do later.

Researcher: Welcome IA to the discussion, please feel e to contribute your experiences, they matter a lot despite you joining us e. What is the position of EE in IA at this college?

IA. It is not highly regarded as it is not found as topics. EE does not stand out clearly instead it is infused in other topics for example when you are teaching on timber you also look at how the wood shavings will e managed. But we teach it in other topics where it appears as subtopics or content.

Researcher: What challenges do you encounter in teachi g EE as fused in other topics?

Usually it is ignored as it does not appear in the schemes or syllabus. Another issue is lack of resources mainly books. Colleges don't have the necessary books to enable acquire the knowledge and apply it.

Researcher: what is your goal of teaching EE in whatev r form you teach it?

It's just to raise awareness about the environment... the students will change their attitudes and behaviour when they have learnt about the environment.

Researcher: What are the effects of using the crosscutting issue approach in teaching EE?

LLE: It does not receive the attention it deserves as some tudy areas for example mathematics, LLE, ES tend to ignore it with an assumption that other study areas such as SE and SSME are teaching it.

SE: There is a problem of duplication of work taught and t brings boredom to the students as there is no team planning.

ME: It requires all study areas to be meeting and carry ou am planning to as to avoid duplication as SE has said. Meaning.....extra ti is needed for meetings to carry out team planning.

IA: Study areas will be overloaded with new issues which will reduce on time spent on teaching the study area content.

Researcher: Are there other challenges that you feel have not been ed in the discussion about the teaching of EE and the way you perceive it?

Then ladies and gentlemen we have come to the end of the interview. I would like to thank you for your active participation in the discussion and as I assured you this discussion will be not be exposed to other authorities apart from those in academic circles. Thank you and stay blessed.

Appendix 5: SCHEMES OF WORK, LECTURE PLANS AND RECORD F WORK FORMATS USED IN THE TWO COLLEGES

i. SCHEMES OF WORK FORMAT

Week	Topic/Content	Specific outcomes	Resources/ References

ii. LECTURE PLAN FORMAT

Date……. ***Classes*** ……

Topic/Concept/ Issues:

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Resources:

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Specific Outcomes:

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Learning Activities:

a. Students' experiences;

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b. Information sharing;

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c. Application (assignments)

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Evaluation

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iii. RECORD OF WORK – CURRICULUM COVERAGE

Term ……

Classes ……

Date	**Work Covered**	**Tutor's Reflections**

Supervisor's remarks

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