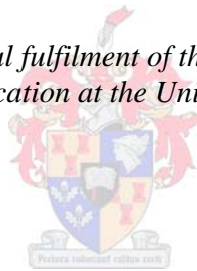# An Evaluation of a Professional Development Programme in Environmental Education

by
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*Thesis presented in partial fulfilment of the requirements for the degree of Masters in Education at the University of Stellenbosch*

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Declaration

I the undersigned hereby declare that the work contained in this Thesis is my own original work and that I have not previously in its entirety or in part submitted it at any university for a degree.

Signature ………………………………………………………………….

Date…………………………………………………………………..

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# Abstract

This thesis is an interpretive formative evaluation of a Professional Development Programme in Environmental Education. The specific aim of the study was to evaluate the extent to which the programme has enabled professional development of teachers; the degree to which the processes of this specific Professional Development Programme (PDP) has enabled implementation and the nature and the amount of take-up of the PDP processes.

The data for this research were generated through semi structured interviews, focus group discussions and observations of teachers' projects. Thematic analysis was used as a method of data analysis. Constructivist, formative evaluation informed the epistemology and ontological perspectives that guided data analysis and interpretation and discussions that were made in this research.

Data indicate that professional development programmes involving various stakeholders need to be well controlled and co-ordinated. Communication and motivation need to be integrated into the PD programme by the leadership. The Professional Development Programme was done in isolation and lacked a deep epistemological and ontological grounding, showing minimal research in the process therefore, the communication and motivation need to be integrated into the PD programme by the leadership. Department of Education officials indicated that they were not involved in the planning stage and fulfilled more of a management and co-ordination role. They were not able to monitor the process because they were not informed or assisted to develop a monitoring tool and besides their workload prohibited them from doing so. Teachers reflected various dimensions of take-up from the programme but they were not able to realize the action project (except in two schools). Teachers expressed difficulties in implementing the programme because of full schedules and curriculum commitments in school programmes.

This research has presented the sentiments of the respondents (participants) in this PDP and has come to the conclusion that this Professional Development Programme has potential and improving aspects of it (see chapter 6) will go a long way towards improving the sustainability of this programme, and improving the quality of teachers that are trained in this kind of programme and even beyond. The PDP has enabled professional development in many ways (See chapter 4 on take-up). However, monitoring and implementation came out clear as those aspects of professional development in the programme that require much attention if the programme is to improve and become more sustainable.

# Opsomming

Hierdie tesis behels 'n verklarende, formatiewe evaluering van 'n Professionele ontwikkelingsprogram in Omgewingsonderwys. Die hoofdoel van die studie was om die mate waarin die program onderwysers in staat gestel het om professioneel te ontwikkel, te evalueer insluitende die mate waarin die prosesse van die spesifieke Professionele Ontwikkelings Program(POP), implementering in staat gestel het, asook die aard en hoeveelheid opnames van die POP-prosesse.

Die data van die navorsing is verkry deur semi gestruktureerde onderhoude, fokusgroep besprekings en waarnemings van onderwysers se projekte. Tematiese analise is as metode van die data analise gebruik. Konstruktivistiese-, formatiewe evaluering het die Epistemologiese en Ontologiese perspektiewe bekend gestel wat data analise en interpretasies en besprekings wat tydens die navorsing gemaak is, gelei het.

Data dui daarop dat Professionele ontwikkelingsprogramme wat verskeie belanghebbendes insluit, goed beheer en gekoördineer moet wees. Kommunikasie en motivering moet ingesluit word in die POP-program deur die leiers. Die Professionele ontwikkelingsprogram is in isolasie uitgevoer en het 'n aansienlike gebrek aan Epistemologiese en Ontologiese begronding gewys wat minimale navorsing in die proses getoon het. Kurrikulum Adviseurs het aangedui dat hulle nie betrokke was vanaf die beplanningstadium nie en dat hulle 'n bestuur en koördineringsrol vertolk het. Hulle was nie in staat gewees om die proses te monitor nie, aangesien hulle nie ingelig of gehelp is in die ontwikkeling van 'n moniteringsinstrument nie, wyl hul werklading hulle ook verhoed het om dit te doen. Onderwysers het verskeie dimensies van opnames vanuit die program getoon maar kon nie die aksie projek laat realiseer nie (behalwe in twee skole). Onderwysers het probleme in die implementering van die program getoon weens vol programme en kurrikulum verpligtinge binne die skool programme.

Hierdie navorsing het deur om die sentimente van die respondente (deelnemers) in die POP te vertoon, tot die gevolgtrekking gekom dat hierdie professionele ontwikkelingsprogram die vermoë het en met die verbetering van sekere aspekte daarvan (sien hoofstuk 6), ver sal gaan in die verbetering van volhoubaarheid van die program, en deur die verbetering van die huidige onderwysers se kwaliteit wat opgelei is in hierdie program. Die POP het in baie opsigte professionele ontwikkeling tot gevolg gehad (sien hoofstuk 4 oor opnames). Nietemin het monitering en implementering duidelik na vore gekom as professionele ontwikkelings aspekte,wat indien nie genoegsame aandag verkry, die program geweldig kan laat misluk.

# Acknowledgments

To my Promoter, Professor Chris Reddy, for a mentoring relationship, Supervision competence and the academic rigor he displayed throughout this research study. Sir, thank you for sharpening my ideas and guiding me through the research process and building my career in the professional development of teachers. Thank you for the patience and understanding you displayed throughout the research period. Thank you, too for the network that you created in the process.

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# List of Diagrams

# Acronyms/Abbreviations

EE - Environmental Education

PDP- Professional Development Programme

PD- Professional Development

FGI- Focus Group Interviews

SI- Semi-structured Interviews

EEPUS – Environmental Education Programme in Stellenbosch University

NEEP - National Environmental Education Policy

GET – General Education and Training

FET- Further Education and Training

C2005 - Curriculum 2005.

NCS - National Curriculum Statement

Bed -Bachelor of Education

MA - Masters of Arts

INSET - In-service Training

# Chapter 1
# Introduction

## 1.1  Background and motivation of Research

During recent post graduate studies I engaged with modules related to Environmental Education research and completed modules on instructional leadership in curriculum studies. Through my personal career experience within the field of education as well as engaging with literature on the working experience in the life of teachers (Jansen, 1999a: 3), I developed a strong interest in the field of Environmental Education and the professional development of teachers.

Literature points to the fact that there are few specialists within the field of EE (Rosenberg, 2009, p.1; Adler and Reed, 2002, p.1). The National Curriculum Statement (NCS) for South Africa, however, requires the implementation of Environmental Education by all teachers (Loubser, 2005, p.53). Furthermore professional publications on the global need for qualified teachers and professional development within EE are widespread. Through my links with the Environmental Education Programme University in Stellenbosch (EEPUS) I became aware of a project aimed at professional development of teachers in Environmental Education. The initiative taken by this specific Professional Development Programme (PDP) represents an intervention towards professional development of educators on EE. This research is focused on evaluation of this professional development programme (PDP) with a view to understanding the process, teacher responses and ultimately to gauge the measure of uptake from the programme with a view to informing future programmes in professional development for environmental education.

## 1.2  Problem statement

Environmental education is an integral part of the national curriculum in South Africa. Le Grange (2010, p.24) indicates that the inclusion of environmental education as a transversal theme and the expectation that teachers would play a more prominent role in locally developed learning programmes would open up opportunities for including locally relevant environmental concerns. By so doing it potentially strengthens the position of environmental education in the formal school curriculum.  Le Grange also urges that, "learning outcomes make it possible for South African teachers to engage with and contribute to the development of emerging themes such as traditional science linked to environmental education."

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Additionally, Rosenberg (2009, p.1), points out that environmental education is an essential part of South Africa's National Curriculum Statements yet teachers and Educators of teachers have very little background within this field. However, an educator as envisaged by the national curriculum statement should contribute to the transformation of education in South Africa (Jacobs, Vakalisa and Gawe, 2004, p. 58).

Internationally, the goal of Environmental Education is to develop a world population that is aware of and concerned about the environment and its associated problems and which has the knowledge, skills, attitudes, motivation and commitment to work individually and collectively toward a solution of current problems and the prevention of new ones (UNESCO-UNEP, 1976). The Tbilisi Declaration which was adopted and established by many countries, established three broad goals for environmental education

- To foster clear awareness of, and concern about economic, social, political and ecological interdependence in urban and rural areas;
- To provide every person with opportunities to acquire the knowledge values, attitudes, commitment and skills needed to protect and improve the environment;
- To create new patterns of behaviour of individuals, groups and society as a whole toward the environment (NAAEE, 2010, pp.2-3).

It is stressed that these principles have been researched, critiqued, revisited and expanded. They still stand as a strong foundation for the internationally shared view of the core concepts and skills that environmentally literate citizens need. Several other conferences that are discussed in chapter two stress the need, goal and urgency of training professionals in EE.

In South Africa, teachers are looked upon as qualified, competent, dedicated and caring. According to the Norms and Standards (2002) National Gazette No 20844, teachers are expected to be mediators of learning, interpreters and designers of learning programmes and materials, leaders, administrators and managers, scholars, researchers and lifelong learners, community members, citizens and pastors, assessors and learning area and phase specialist (Carl, 2004, p.37-40, Jacobs, Vakalisa and Gawe, p.24).

Following the foregoing, therefore, this Professional Development Programme (PDP) is an intervention towards achieving the Revised National Curriculum Statement on Environmental Education which is also compliant with the international goals for Environmental Education.

This specific PD programme aims "to develop global environmental educators through a capacity building pilot programme with a cluster of Life Sciences educators within the Further Education and Training (FET) band from ten schools from two Education Management District Centers" (PDP Proposal to Harambee, October 2007). [Harambee is one of the sponsors of this programme and is recognized by its pseudo name).

"In working toward this aim the project intends to build capacity among the Life Sciences educators through a focused teacher professional development programme to become lead teachers in implementing action environmental projects within the curriculum and ultimately to become cluster co-coordinators who will be able to train other educators"(PDP Research Proposal, 2007). The aims of programmes, however, are not always realized as planned and this one is probably not an exception.

As a preamble to this research, I conducted open discussions with some PDP's staff, and the following problems were highlighted:

- An apparent lack of agency and demoralized school set up.
- An indication of low teacher take-up from the PD programmes.
- The need for a formal evaluation based on criteria for professional development was expressed.

This PDP's aim is to make a difference in environmental education yet the above problems remain a challenge. This research has understood this specific PDP's project and evaluated the professional development programme of teachers.

### 1.3 Research Questions

In view of the above, the main research question is:

- *How has teachers' training in Environmental Education enabled professional development of teachers in EE?*

Two sub questions are:

- To what extent has the professional development process at a Professional Development Programme enabled implementation?

- How effective has the professional development programme been with regards to take- up?[1]

Therefore, this research intends to investigate to what extent has teacher training in Environmental Education in this PDP led to professional development; the extent of take- up of environmental education processes at the PDP and the implementation of the PD and by teachers, Education officials and the PD officials. Take-up from this research is confined by the objectives of this PDP programme. Any other take-up is welcomed by this research, but the take-up will be pivoted by the aims, goals and objectives that this PD programme intended to achieve, how they achieved it and to what extent it was achieved.

## 1.4  **Significance of the study**

It is not this particular programme that remains problematic but the issue of quality teaching has also been a "bone of contention" on a global level, and has sparked more research in teacher professional development (Adler and Reed, 2002, p.1). Teachers that possess the greatest amount of knowledge tend to offer more, and it is my hope that in this evaluation, concerns about teacher quality in EE and what can be inferred from the results to this evaluation can lead to effective ways of doing professional development that would lead to better teacher performance and implementation of EE and higher take-up of PD programmes.

It is also my hope that this research will inform and enhance improvement and sustainability of professional development in Environmental Education in this Specific PD programme. This research will also inform Higher Education institutions that carry out professional development of both pre -service and in service teachers to rethink the kind of professional development they offer to teachers in order to aid sustainability in learning and to empower more professional teachers in Environmental Education.

Again this research opens up windows for more research in this field of professional development; better take-up of environmental education processes, improved implementation, effective partnership development in order to enhance effective learning and take-up and better curriculum planning to suit participants in the training.

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[1] Take-up in this research is regarded as learning that took place from the processes of the PD programme. This includes the learning's of the PDP officials, the learning's of the teachers and the learning of the Department of Education Officials as they engaged in professional development in this specific PD programme.

Environmental education is seen in the curriculum as integrated in the various learning areas. This research depicts that most teachers are not aware of this integration. Therefore this research opens a window of research to investigate and develop ways of helping teachers to see and use these links to create environmental awareness, skills, attitudes and knowledge that is required to sustain the environment while still connecting and teaching the contents of the specific subject area.

### 1.5 Scope of the research

The study was driven by this specific PDP (professional development programme) for environmental educators. Areas of interest were professional development, the curriculum process and environmental education. Respondents include PDP officials, Department of education officials and Life science teachers in the FET phase of schooling.

### 1.6 Target Groups

Further Education and Training teachers' within this PD programme formed part of this research. Eight teachers as participants, two PDP officials, and three Department of Education Officials were interviewed. The curriculum artefacts and documents from the PDP were examined to account for this understanding and interpretation of data.

### 1.7 Provisional Chaptering

- Introduction and Background of the research
- Literature review
- Research Methodology
- Data Presentation and analysis
- Data discussion and interpretation
- Conclusion, remarks and Recommendations

### 1.8 Research Ethics

Ethical clearance from the Stellenbosch University was obtained. Recognized interview measures were observed; respondents were selected based on accessibility and compliance was assured of confidentiality of the process with only pseudonyms used. Babbie, (2007, p.27) posits that researchers must be careful to respect the privacy of participants and the basic ethical rule of social research is that of voluntary participation. Interviews were recorded and the data were kept in a safe place. Details regarding ethics are provided in chapter three.

### 1.9  **Validity of this Research**

Le Grange (2009) defines validity as "a test that measures what it is suppose to measure". There are several validity types but this research adopted Content validity that measures the extent to which a test is representative of the domain that it is supposed to be testing; predictive validity that concerns the extent to which a test score correlates with those of a different task performed at the same time, and triangulation (Le Grange, 2009, p.7). This is discussed in detail in chapter three.

# Chapter 2
# Literature Review

## 2.1 Introduction

This chapter is a review of the existing scholarship in the field of professional development and environmental education relevant to my project, to learn and better understand the central problem of this research. The research in the process of the review seeks to have a convergent understanding of the constructs of professional development and environmental education in order to address the research questions stated in chapter one.

Professional development is a wide field so this review; is narrowed to professional development of teachers in environmental education programmes. The literature review will serve the following purposes as depicted from De Vos, Strydom, Fouche and Delport (2005, p.263):

- Demonstrate underlying assumptions behind professional development and environmental education;
- Build the researchers understanding and knowledge on professional development in environmental education;
- Refine and redefine the research questions by embedding questions in larger empirical traditions - a better way to ensure that this study is part of the cumulative knowledge-building effort regarding effectiveness in professional development programmes.

## 2.2 Professional Development

Professional development is a term that cannot be described in simple terms as it means different things to different people. Understanding how I use professional development in this research requires that I ameliorate the awareness of the construct professional development that I envision. I have explored the various notions and ideas of scholars in this field to give us an overview and a glimpse of what this construct is. Besides, this has facilitated this research to reach a convergence zone of the composite of professional development that I will attempt to distinguish as effective professional development.

When asked to define professional development or to say what comes into to mind when the term professional development is mentioned, several opinions and expressions emerge such as growth, transformation, improvement, broadening scope, self-confidence, new learning and

democracy-*democratic deliberation* (Reddy, 2009, p.25); lifelong learning, personal development; high standards in professionals; competence; adaptable workforce; work security and technological advancement and compliance (Fraser, Kennedy, Reid and McKinney 2007, p.156).

In this complexity[2] scholars have attempted to describe the path or substantiate the term professional development. Fraser et al. (2007, p.156), depict that discourse about professional development is typified by 'conceptual vagueness' and that it is an ambiguous and a contested concept; a distinction between professional learning and professional development has also been a source of contention. However, they agree that professional development is an on-going reflection and review that articulates with developmental and individual needs while learning; they identify it as a process of self-development leading to personal growth as well as development of skills and knowledge that facilitates the education of young people. They argue that whatever the conceptual battles there are in professional development, the vital thing is that it is "a process that, whether intuitive or deliberate, individual or social, results in specific changes in professional knowledge, skills, attitudes, beliefs or actions of teachers" (Fraser et al., 2007, p.157).

### 2.2.1   What Is Professional Development? (Evans)

Evans (2002, p.1) asks the question "What is Teacher development?" this question I find interesting; it is the core and the crux of understanding and doing any kind of professional development that one plans. The insight, comprehension and conception of professional development determine the kind of goals, perspectives, ideologies, epistemology, ontology and practicability that a particular PD program will run. Evans (2002, p.124) engages in her discussion to reveal the fact that many intellectuals in the field of professional development of teachers have been engaged in professional development without describing what PD actually is a fact that Fraser et al. (2007) also accented earlier. She also admits that much has been written about professional development, but the area of identifying what professional development really is has been neglected.

She therefore attempts to describe professional development based on her own experience and ontological perspective of what she thinks professional development is, and what in reality

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[2] Fraser et al. (2007, p.157) adds to this fact when they say that, given the complexities of professional development, professional learning and professional change, they argue that an evaluation of PDPs and models need to be able to take into account the range of complex factors impacting on a specific professional development programme.

she has experienced regarding this phenomenon. Based on her experience as a primary school teacher, interactions she had with her colleagues, moving on to further training in B.Ed, MA and her attainment of a doctorate has enabled her to express herself on the concept of professional development (p.123). She also admits that her experience of this phenomenon has enabled her to diagnose the fact that the concept, the parameters and the process of teacher development have been ill-defined. She recommends that the description should be clear and precise for stakeholders to understand and should be in line with the current trends and aid towards a common understanding. She also maintains that a common understanding would bring convergence of what professionals in this field will agree for it to be. Evans (2002) adds that seeking a definition, gives direction, and delimitation to the construct that one is dealing with, it adds meaning to specific researchers in what they have chosen to use as professional development.

Evans describes professional development as "an ideologically-, attitudinally-, intellectually-, and epistemologically-based stance on the part of an individual, in relation to the practice of the profession to which s/he belongs, and which influences her/his professional practice" (Evans, 2002, p.130). She takes into consideration professional development as a progression which may be continuing or which has occurred and is completed in a transitory manner.

She also considers professional development may be a process of internalization on the part of the teachers, or it may be an externally applied process, directed at teachers but affected by external agencies. However, these processes are not always successful and might sometimes fail and as such nullify the classification of such PD as successful professional development processes Professional development is meant to improve teachers' knowledge, skills and practice. It is "the process whereby teachers' specialism and/ or professionalism may be considered to be enhanced" (Evans, 2002, p.131).

Evans highlights elements of professional development as: "Attitudinal development and functional development" (2002, p.131). Attitudinal development for her is a process whereby teachers' attitudes to their work are modified; with the notions of intellectual and motivational focus while functional development is the process whereby teachers' professional performance may be improved with the notions of procedural and productive focus.

She also describes two forms of professional development: 1. Role development as a process in which the accepted limits and responsibilities of specific recognized specialist professional roles may be redefined and or modified, and 2. cultural development as the process in which teachers' professional culture is redefined and /or modified (Evans, 2002, p.132).

I consider Evans's (2002) ideas as vital as well as elements which I deemed fit for the evaluation of this specific program. Reddy (2004, pp.137-138) described professional development as a process of democratization, a process that enables self-development, self-fulfilment and self-determination. This Reddy further argues can be achieved through opportunities that are accorded to teachers. This democratization of PD can also be seen as a reflexive process of liberation of thoughts and practices in order to preserve freedom, choice and emancipatory practices.

Webb (1996, p.2) on the other hand, asserts that there are many definitions of professional development but that there is a reasonable degree of convergence and suggests that it includes the institutional policies, programmes and procedures which facilitate and support staff so that they may fully serve their own and their institution's needs.

According to Webb (1996, p.2), professional development can take the form of workshops, seminars and symposia about various topics, conducting teaching consultations with individual teachers or with course terms and then conduct further research and evaluation projects for related matters in this case for teaching and learning and improving performance in Environmental Education.

Reddy (2009, p. 25) goes further to substantiate that sometimes professional development and INSET are used interchangeably but specifies that INSET is for teachers who have had formal training. Thus, Reddy affirms that an all-embracing definition of professional development is difficult to develop, but presents Bagwandeen and Louws (1993, p.19) definition of INSET as "embracing all the experiences that a teacher may undergo for the purpose of expanding his/ her professional or personal education. Veenman and Van Tulder (1994, p.303) in Reddy define this as "a coherent set of activities to deepen and broaden knowledge attitudes and skills that are directly connected with the profession of teaching to improve teachers' professional competence and the effectiveness of their school" (2009, p.25). Shawer (2010) moves this further and emphasises that this process includes all types of professional learning undertaken by teachers beyond the point of initial training.

Reddy (2009) captures the meaning of professional development from Little and Houston (2003, p.76) That captures my attention, when they say, "professional development is a goal orientated and continuous process supported through mentoring, coaching and feedback and contextualised to address the perceived needs of students within individual classrooms and schools". This definition imbibes the notion of a process that is continuous; it magnifies the dynamic nature of professional development; it also stresses that professional development

must take context into consideration as well as the specific needs of the teachers and the school in question. It emphasises the way or manner or forms in which this is to be done through mentoring and coaching which ends in accountability or a feedback mechanism. Craft's (1996) definition moves it further to be specific that teachers are moved forward in knowledge and skills. Shawer (2010) supports Craft (1996) and states further that professional development is an on-going improvement of professional knowledge and skills during one's career and that it improves teachers' practices and profession.

It is therefore important that a thorough understanding of the concept of professional development ushers this research to work in a constructive space of professional development, using various viewpoints to construct meaning for this study.

### 2.2.2   Is Professional Development Necessary?

Bottery's reaction towards transformation in the education of teachers is an urgent one when he says "education professionals are at an important crossroads. Given the kinds of global pressures, national government aspirations and professional compliance, many retreat into the antithesis of globalization…" (2004, p.195). Heystek, Nieman, Rooyen,  Mosoge, & Bipath (2008,  p.140) echo that, in order to improve the quality of education for all in South African schools, educational policies pre-empt the need for staff development which is tied to its historic inequality. Moreover, the changes in the educational curriculum prompts challenges among teachers who were trained especially before these implementations were made. Reddy (2004, p.138) observes that, in South Africa there has been a myriad of changes in the curriculum that demands competence in teachers to be creative and innovative in their practice. Therefore, teachers need to be equipped in innovation so that they can be able to implement their own programmes into education as long as they are able to achieve the outlined outcomes in the curriculum. Fraser et al. (2007, p.155) confirm that research suggests that professional development is an essential part of improving school performance.

These and many factors necessitate the need for teachers to be retrained and sustained in order to cope with the changes; as such staff development is basic for improvement in the quality of teaching and learning. These challenges may be addressed through development geared toward professionalism especially among educators if success is to be visible in the today's school with its challenges.

Peter (2009, p.2) articulates that in order to assist teachers, a staff development program is essential. In designing professional development programmes it is central to focus on the

problem areas identified via assessment research, which then is incorporated together with the teachers for school effectiveness. In determining training and development aims and programme content, the first step is choosing the right development program which requires thorough research through assessment among teachers so that specific problems can be identified. This then enables the developers to know exactly which areas to target in the training of specific teachers or for which the kind of knowledge and professional development to plan.

School as an organization, (in a broader perspective from the ministry of education or as a unique organization in its employment of educators by the School Governing body), has its ultimate goal of providing quality education which in turn promotes quality teaching and learning. This process, however, requires people who are competent and qualified in order for this goal to be realistic. This process also requires competent leaders who are visionaries, and able to persuade/ carry along the school community especially the teachers into achieving this goal. Van der Westhuizen, aptly puts it that,

> educators are in the business of human success…which is measured by "distribution curve"…education should rather be a process that encourages continual progress through the improvement of one's abilities, the expansion of one's interest and the growth of one's character… This implies that success also means that optimization of people's potential in the school. When an organization accepts co-ownership and creates a climate for success, the whole organization experiences success and is able to move forward (Van der Westhuizen, 2007, p.270).

In other words, the venture to try and become successful in this task requires leaders who are knowledgeable in assessing and developing teachers in order for this goal of quality in education to be achieved.

This chapter is concerned with the question as to whether professional development in Environmental education can be used as a key processes to achieve quality teaching and learning in environmental education. This chapter will promote these aspects while outlining possible components that will enhance sustainable professional development in environmental education programs.

### 2.2.3    Indicators for an Effective Professional Development

Reddy (2004, pp.139-140) outlines important features that must be recognized in professional development if effectiveness is to be achieved and Penuel, Fishman, Yamaguchi and Gallagher (2007, pp.928-937) also indicate that an effective professional development programme should be able to include some fundamental features. The discussion that follows is an amalgamation of Reddy and Panuel et al.'s admonitions.

#### 2.2.3.1    Context

The context within a history and social processes. The background of teachers, their prior knowledge, needs and setting of the teachers, their world views, experience and resources should be established before planning. Context with regard to diversity is also a contextual factor. Context of the teachers attending PD is crucial to any kind of PD. It affects school schedules, budgets for equipment and materials; time for planning and reflection are constraints that might influence how a professional development programme runs. Fraser et al. (2007, p.159) stress that "contexts need to be supportive to allow enactment and risk-taking…relationships between individual and group need nurturing".

#### 2.2.3.2    Viewing Lenses:

The *lenses we use in viewing the roles of teachers* determine the kind of professional development that we design - Whether we view teachers as technicians or as professionals then that is what will reflect in the type of professional development we design.

#### 2.2.3.3    Attitudes and Prior knowledge:

Professional development is to *encapsulate the attitudes, the prior knowledge of teachers*, and the deficits of the candidates for the development and consequently the entire need and a holistic approach to PD. Additionally, knowledge of *how people learn* and reform innovations should form part of a Professional Development's curriculum (Reddy, 2004, p.140; Penuel et al., 2007, pp.928-937; Fraser et al., 2007, p.159). Additionally, recognition of teachers' needs before planning for the professional development programme is crucial in planning a PDP (ibid). "Teachers' beliefs, values and attitudes; interest and motivation needs are important considerations that should be addressed in professional development" (Fraser et al., 2007, p.159).  Similarly, professional development is seen to be concerned with people (teachers) leadership that acknowledges, teachers (people) as emotional beings, with feelings, as well as needs with which they experience each other (Webb, 1996, p.35; Heystek et al., 2008). This is an important aspect that can lead to success in professional development.

### 2.2.3.4    Designs and quality of implementation:

The *designs* should be determined through experiments by the providers of the professional development and the achievement of high quality in implementation (Reddy, 2004, p.139). The PD program developers should put into consideration the perception of teachers to regard the design and coherency in their training through the professional development as essential to their learning and implementation. The various reform approaches used to the professional development should be linked to the design and outcomes of the planned professional development programme. Besides, PD is to be able to *influence teachers' knowledge* and their ability *to implement* the program (Reddy, 2004;  Penuel et al., 2007, pp.928-937). The design of the professional development should ensure that teachers' learning and activities to be used during the period of learning are appropriate and able to facilitate learning. Moreover, "links between theory and practice need to be strong. Intellectual stimulation and professional relevance" are required in designing professional development (Fraser et al., 2007, p. 159).

### 2.2.3.5    Collaboration / Collective Participation:

Collaboration or collective participation of teachers from the same school is also a factor that the professional development should pay attention to in order to expand their knowledge and skill with focus to content knowledge, as well as active and inquiry based learning approaches. Collaboration connotes teachers working together contributing their own expertise as they put ideas together to improve their practice. Additionally the nature of PD should enable teachers to collaborate actively in promoting the implementation of the new ideas in the PD. Collaboration improves and builds relational trust among teachers within the PD as well as in their school context. In addition collaboration also becomes effective in the coaching process of a PD in order for implementation (English, 2005, p. 68). Frost, Akmal and Kingrey (2010), promote collaboration as a means of providing effective and sustainable teacher professional development.

Collaboration, according to them, improves teachers' instructional approach and students outcomes. Collaboration, they add, can be extended to the offering of funding grants and across multiple institutions. Frost et al. (2010) accent that research has proved that achievement of outcomes hoped for has not always been realised in most professional development programmes but collaborative inertia is the effort of such programmes.

### 2.2.3.6    Duration of the PD

Time allotted to teachers to plan for the implementation and provisions of technical support are also significant in promoting implementation of this particular PDP (Fraser et al., 2007). Duration of the Professional Development should be long enough to allow teachers opportunities to integrate new knowledge into practice. It should also allow time for educators to develop investigative cultures, close coordination and be aware of important features as employment reform-oriented professional development.

The goals and objectives of a PD programme are significant as it facilitates interpretation of the PD programme's intentions, and planned activities. Furthermore the goal serves as a yard stick to evaluate the extent of effectiveness of any given PDP.

### 2.2.3.7    Coherence and alignment

Teacher's goals and work requirements are also an essential aspect that improves the implementation of the PDP intentions, objectives and goals. Therefore, the alliance between the two is vital if the PD programme is to be sustainable. Additionally, upgrading, alignment of curriculum, pedagogical strategies and assessment are a range of themes that augment effectiveness in Professional Development. The extensiveness of environmental education curriculum in professional development should be done in profundity while considering the existing curriculum reforms and educational policies. The professional development design should experimentally reveal and promote implementation and achievement of the 'learners' [environmental educators] (2007).

The ultimate goal for any professional development (of environmental education) is enabling to implement, to put into action and practice what they have learned. If this is lacking then evaluation is required to put this in place.

It comes out clear in the above reviews that any professional development plan should take into consideration the needs of environmental educators who are the role players and participants in the professional development process; otherwise the implementation is prone to mediocrity and a waste of time.

### 2.2.4    Models of Professional Development

Reddy's (2004, p.142) research indicates, that professional development that was planned in training teachers in South Africa for the foundation phase in curriculum 2005 prompted diverse responses from teachers, which posed a lot of questions as to whether the professional

development model adapted by the developers at that time was effective or not. This specific professional development programme viewed teachers as technicians and not specialists, hence unfavourable response from teachers; it is obvious that this professional development did not put the above into practice.

Two models of professional development are presented by Reddy as: the defect model and the growth model. The first model sees teachers as lacking empty vessels that need to be filled with knowledge and the latter model sees teachers as people who need to grow, and also views education as a complex process that has no one right way and that learning is a process of growth.

Surveys made by Reddy (2004) reveal the emergence of new approaches to professional development like the cascade advocacy and cascade and cluster approach. I will not lunge into this at the moment.

In line with the above paragraph, Panuel et al.'s (2007, p.928) sanction is appropriate as they promote the use of reform strategies of learning to enhance professional development as compared to the traditional methods which do not take into consideration the paradigm shifts and the dynamic nature of education. These reform strategies they propose include coaching, mentoring and participative groups or study groups which need to be integrated into professional development rather than using workshops, because workshops limit teacher participation and "do not allow teachers to explore new concepts and teaching strategies enough in depth". However, they argue that workshops can be designed to be more participatory; inquiry based and making learning more active. The training offered should be linked to the curriculum, to enhance pedagogical strategies, use of materials and administer assessments associated with particular curricula.

### 2.2.5 General Views on Criteria of Selecting Participants into Professional Development

Comparatively, in order to assist teachers in a specific professional development programme, Peter (2009, p.2) observed a programme that was designed with central focus on the problem areas which were identified through assessment research and was incorporated with teachers' professional needs and school effectiveness in mind. In determining training programmes and developmental aims, the program content and curriculum were the first steps. This then enabled the developers to know exactly which areas to capitalize on, in the process of training of specific teachers.

Assessment is a vital way to determine the kind of participants that are liable or due for professional development that is designed to meet teachers' needs. I believe that assessment is an integral process that drives learning and take-up in the professional development processes. To accomplish professional development objectives and goals that are realistic, fair, reliable, achievable, valid and of academic integrity, then assessing potential participants will help determine the needs, and nature of professional development that the PDP and the participants desire. This then gives the baseline in which the PD providers can equate their PD to the participants needs.

Professional assessment is the initial step used to determine the needs of the individual and the organization so as to be able to plan both future professional development and activities. Assessment is also linked to the specific methods used to obtain information on the performance of individual employees it also denotes making judgment of a person's feeling or situation after careful consideration (Heystek et al., 2008, p.131). Sykes defines it as; an estimation of value, magnitude or quality of something (1976, p.56).

In this research I used assessment to refer to those steps that are used to determine the baseline for professional development of educators in life science educators (who are seen as due for professional development in environmental education). This is important because assessment will aid the process of evaluating how the participants were selected into the PDP and how the PDP planned to meet participants' needs. Assessment also aids in determining and evaluation of improvement in the school performances and teacher practices. Assessment is also crucial for effective monitoring and implementation processes that teachers engaged in prior to and after professional development that they went through in order to improve take-up and sustainability of this specific programme that I evaluate.

### 2.2.6 Assessment as a Tool to Determine Participants Liable for a Sustainable PD Programmes

Teacher quality has become a top priority in educational policy where students' outcomes are determined by the teacher (David et al., 2008, p.12). An educator is an employee of the provincial Department of Education or the school governing body, depending on the nature of the organization of the school; this implies that the educator therefore is answerable to the employer as far as his/her performance is concerned (Heystek et al., 2008, p.135).

That is, the educator is accountable to the employer as far as her job description and responsibilities are concerned. In order for any assessment to be carried out there must be

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some standards or rather job stipulations and requirements that the educator is required to achieve; if these stipulations are absent then the employer is compelled to diagnose the possible hindrance to this achievement, hence an assessment becomes appropriate at this juncture which then necessitates a plan toward professional development of that particular educator. Heystek et al. (2008), maintain that the purpose for such an assessment firstly is to determine whether a person is performing on an acceptable level and secondly is able to give recognition and identify developmental needs as a basis for career planning (2008:140). Moreover, education today demands grossly the need to manage individual performance in the context of achieving organizational goals (quality teaching and learning); this entails performance and plans for future development in the light of the individual capability and what the school is trying to achieve (Lumby et al., 2003, p.121).

Assessment can take two forms, the formal and the informal. The formal involves a structured process of negotiation within the organization where performance is rewarded, and promotion takes effect according to the current South African Integrated Quality Measurement System (2008, p.140). Staff assessment helps with the improvement of individual educators' potential in a transparent manner with a view to determining areas of strength and weaknesses and to draw up programs for individual development; performance is measured based on the school's policy and this helps in promotions and additional remuneration accordingly. It also determines affirmation of appointments, rewards and incentives. It also aids the evaluation of the general effectiveness of a school as far as the quality of teaching and learning is concerned (ibid). Based on the South African History, assessment was very secretive but today it is more open and fair in its development. The informal assessment involves team work among peers, mentoring and collective responsibility.

Competent leadership is the core in which effective assessment can take place for the dream of quality learning and teaching to come true. Van der Westhuizen (2007, p.270) however, asserts that for the school to achieve the success of its organization, which in this case is quality teaching and learning in environmental education, everyone in the organization has to work towards the same goals and share commitment to a shared vision, everyone needs to understand the goal and the processes that are involved in order to realize quality teaching and learning. Organizations are to be designed around teams and team development; the organization is to be committed to increased performance by means of setting measurable goals which are to be communicated from the start in order to give teachers direction which way to move. Moreover, effective managerial tools are to be used for measurement and feedback on a day today basis.

Bottery's conclusion sound very appropriate at this point when he says

> Current forms of accountability are predicated upon two models. One model is driven by the market and the search for financial efficiencies and is underpinned by assumptions of accounting logic, which requires some measurable outputs and added values and that it is possible to undertake this evaluation… and secondly, accountability driven by standardizing and controlling agendas. If organizations are to be successful in the knowledge economy, they need to generate greater creativity, teamwork and problem solving and that this entails a more extensive sharing of information within a flatter organization form (2004, p.193).

Additionally, in an article, Webbstock (1999, p.162) draws out some reflections that add flesh to this research. He proposes a model that sounds appropriate in assessing the quality of teaching and learning in environmental education. This model nullifies the former way of assessment that made South African teachers feel as though they were being controlled.

He outlines these areas as important for the assessment of the effectiveness of an educator:

- The candidate's philosophy of teaching;
- The candidate's methods of teaching;
- Peer and student/learner's evaluation of the candidates teaching;
- The candidate's further study relating to the teaching and learning[in environmental Education;
- The candidate's curriculum development activity; the sharing of teaching expertise with others…

David, (2008, p.12) and Lumby, David, & Kaabwe (2003, p.1) concur with Webbstock's above inference about the aspects of assessment in professional development.

This also implies that, for the teaching and learning in environmental education to be assessed properly the people involved in the assessment have to be qualified teachers who are also competent in this field. Thus, competence is to accompany school leadership and the leadership of the professional development programmes if quality and sustainability are to be realised.

Theoretically, teaching and learning in environmental education are perceived by constructivist as involving contexts as: revision of previous knowledge in order to be able to acquire new knowledge; constructive social processes - involving cooperative and collaborative approaches and transformative dimension in nature.

Likewise, constructivism is a theory that informs the South African curriculum, that the ideas mentioned above can also form the basis of assessments in order to validate the effectiveness of the kind of teaching and learning processes that go on in any given professional development. Moreover, as a provision of clear information in teaching learning goals, opportunities for learners to engage in a thoughtful practice and provision of diagnosis of learners' understanding, constructive feedback is essential. The demonstration of an understanding of these present levels of students' knowledge and abilities are very important aspects for assessing teaching and learning in environmental education, which can clearly be transferred into the implementation of any given professional development programs (1999, p.168).

### 2.2.7    Ways to Ensure Implementation in PD Programmes

In designing a program Veenman (2009) citing Van Tulder (1992), analysed that staff development as well as in-service activities he organised did not produce lasting effects; besides, staff development unaccompanied by a transfer of training was less productive. Together Veenman (2009) and Heystek et al. (2008, p.162) admonish that if effectiveness in quality professional development is to be achieved then more time, energy, money and transfer of training are necessary to boost this process. Other scholars in this field however, have identified that staff training is designed to develop new skills and new knowledge for application on the job. Transfer of training ensures that the skills and knowledge acquired during the training are applied at work. Thus, partnership becomes an important factor in this training.

The teachers as learners, trainers as PD developers and the managers as school leaders and education departments as teacher's employers have important contributions to make in this process of development. For instance they are to collect performance data, systematic design instruction, and involve the school leadership and explore the training options and participate in advanced activities. This training then goes on for whatever period of time. Depending on the area of focus, the design outlines ought to be read out to the parties, after which coaching is affected.

Training transfer requires coaching. However, coaching involves in classroom assistance and support in the application of skills and knowledge in the classroom (Veenman, 2009; Bennett, 1987; Joyce & Shower 1988; 1980). Coaching is a crucial process that ensures companionship, technical feedback, analysis application, and allows the teacher to adapt and help in personal facilitation (ibid). Coaching connotes transformations in the teachers as they

go through this process of growth; transformation is also consistent in spite of the personnel changes (Goethals et al., 2004, p.199). In coaching, the literature review reveals that trust plays an important role for transformation to take place (Heystek et al., 2008; Goethals et al 2004, p.201) - periodic evaluation of this process is necessary.

There are many factors to consider in quality teaching and learning but due to time and space, this research is limited to professional development as key processes that lead to successful teaching and learning in environmental education. This chapter therefore revolves around professional development in environmental education and a literature review as to what, why and the how's of professional development respectively, and how this is linked to the goal of education as quality teaching and learning.

## 2.3  Environmental Education

Environmental Education is complex and cannot be defined in simple terms. Different scholars in this field have made attempts to describe environmental education based on their own outlook. I will try to portray some of the major frames of mind on the view of environmental education. This understanding will help us with the construct validity on environment education in order to carry us along through the understanding of professional development that is envisioned in this field.

It is my belief that a glimpse on understanding environmental education will help direct and define the kind of professional development and implementation of Environmental Education that is desired. Different people interpret the meaning of Environmental Education to what they think it is. Here I will outline some of the thoughts and an expression of what EE has been understood to be.

The moment I come across the term environmental education the questions that arise are: What is it? How is it done? When it is done? Who does it? Where is it done? Why is it done? … (Palmer and Neal, 1994, p.3). Different people define environmental education in different ways, some based on their experiences, others based on major world conferences addressing the global need to sustain the earth; again others according to their childhood experiences of the environment; and to some it is a response to the environmental risks, issues, global warming, climate change, and economic inflation.

Janse Van Rensburg states that,

> Environmental education is widely regarded as a key response to the Environment crisis. The 1992 United Nations Conference on Environment and development concluded that education is critical for promoting sustainable development and improving the capacity of people to address environment and development issues… (1994, p.4).

Palmer and Neal, (1994, pp.1-10) note instances where environmental education is seen to have an ultimate goal of sustainability for future generations, where the aim is producing well informed environmentally active adults who will in turn be responsible to care and create a an apprehensive attitude towards the environment. Others describe Environmental Education based on their aesthetic awareness, and others associates the most basic links between education and the quality of the environment which includes the outdoors as a resource for in action learning.

Engleson and Yockers (1994) describe Environmental Education as helping students to grow more environmentally conscious, well-informed, skilled, dedicated citizens who are committed to work, individually and collectively to guard, improve and sustain the quality of the environment on behalf of present and future generations of all living things. On the other hand Lotz (2002) reveals that environmental education plays a role in reflexivity in response to environmental issues and risks.

Environmental education is also viewed as a process aimed at developing a world population that is aware of and concerned about the whole environment and its associated problems, and which has the knowledge, attitude, motivations, commitment, and skills to work individually and collectively toward solutions of current problems and the prevention of new ones (UNESCO Conference in Tbilisi, Georgia, USSR in 1977). Moreover Stapp, Wals, and Stankorb (1996, p.5) view environmental education as an open-ended process that helps people make sense of an increasingly complex world. They go further to substantiate that the field of environmental education cannot be seen as isolated from other emerging educational fields, elsewhere, the focus is on human right issues, development issues, and peace and conflict issues. It also considers ethical questions regarding the sharing of the world's natural resources. They urge that educators should involve people in environmental education, including students in the challenges of the current times.

Sisitka (2002) notes that environmental education has expanded with increasing emphasis on the role of education in responding to wide ranging complex environmental issues and risks, he explains further that

Chapter 36 of agenda 21 and the Treaty on environmental education for sustainable societies (adopted at the plenary Earth Summit meeting by the International forum of NGOs and Social Movements on 12 June 1992) both recognize the central role of education in shaping value orientations and social action. Thus, environmental education is seen as both socially transformative continuous learning processes based on respect for all life. NGO forum principles have become influential in post-apartheid South African environmental education circles, as they show a concern for social justice, equity, democracy and social transformation… (2002, p.100).

Le Grange and Reddy (2009, p.2) clearly indicate that early approaches to environmental education have been assessed as having rather narrow conceptions of the environment, the nature of the crisis and the kinds of actions to be taken. The environment was mostly considered as nature, where in ecology it is pivotally applied to biophysical surroundings. This perception has been disputed and presently environmental educators accept that the concept of environment includes interactions between social, economic, political and biophysical dimensions (ibid).

Environmental education is more than the biophysical; the South African situation presents environmental issues that are unique and complex as a result of both modernism and its delinquent cousin apartheid that looks beyond the biophysical. Reddy and Le Grange state this clearly:

…Overcrowded townships, the air heavy with smoke: barren soils, scarred by ravines and bereft vegetation; people and land under threat from toxic waste dumps, polluted rivers and pesticides. South Africa is suffering from decade of environmental mismanagement, aggravated and institutionalized by apartheid, which forced people to live in rural and urban areas unable to sustain themselves (2009, p.3).

The United Nations Publication on Environmental education (UNEP, 1993, p.3) depicts the belief that the determination to contend with the global change concerns depends fundamentally upon behaviour changes in humans brought about by proper education. For this reason environmental education is seen as key channel to convey global modifications through instruction. Environmental education is seen as a devise toward the right strategies to involve people in the search for solutions with an objective to develop a world population of environmentally responsible citizens. Similarly Stapp, Wals and Standorb stipulate that, "If education is responsible for helping students become aware of their options, then it should encourage them to become active and deliberate citizens" (1996, p.25). Stapp et al. goes in detail to discuss different orientations that dominate educational curricula and consider social critical paradigm as an orientation that will promote full participation of the school community and has a main thrust in the shifts schools should encourage in developing critical

thinking skills and to examine values. In developing an environmental education professional development programme, important issues like those Stapp et al. discuss are crucial in curriculum planning.

From the foregoing, Van Rensburg (1994, p. 5) responds to the UNEP ideology on environmental education as partial and passive. She advances her argument and validate that environmental education is not all about information feeding and awareness creating venture. She retorts that this is a narrow perception of what environmental education is; it is not about changing behaviour. However, environment education goes beyond passive information feeding to participation in active experiences in a critical orientation paradigm, and this is also obtainable commonly is South Africa. This is seemingly a narrow conception of what environmental education is. This is rather a partial view of environmental education. Environmental education is not all about creating awareness through information feeding in passive experiences but doing this through active experiences in a critical orientation paradigm, which is also obtainable commonly in South Africa (Jansen Van Rensburg, 1994, p. 5).

Jansen Van Rensburg categorically, indicates that

> There is lack of critical reflection on the meaning and goals of 'environmentally responsible behaviour' ...and on the assumption that certain kinds of expertise would be shaping that behaviour. The supposition seem to be that scientist and their messengers, the educators, know how to solve environmental problems, and if we can devise the best techniques to communicate the information or messages, individuals would take heed and rationally change their behaviour; these individual actions would add up and solve the crisis. The assumption of scientism, technicism, rationalism and individualism are conspicuous (1994, p.9).

This is pointing to the fact that environment is a complex construction and having this basic foundational understanding of the complexity of environment will help educators to plan for professional development that is relevant and contextual. Environmental educators need to understand this complexity before endeavouring or venturing into the field.

### 2.3.1   Action Competence Approaches In Environmental Education

From the perspective of Jensen and Shnack (1997, pp.163-177) from the Royal Danish School of Educational Studies in Copenhagen, an action competence approach to environmental education is crucial. It is not enough to try to construct the meaning of environmental education, but the complexity is hastened by understanding different views given to environmental education.

Action competence as described by the scholars above seems appropriate at this point in embracing its constituencies for an environmental education programme. They press that environmental education is pivotal to "building up student's abilities to act-their action competence- writing reverences to environmental concerns" (p.163). That is to make students capable of envisioning alternative ways of development and to enable them to participate in acting according to these objectives.

Action competence, they say comprises an analysis of the nature of the environmental problems and an idea of education as something more than academic schooling or behaviour modification. They expand to say that environmental problems are becoming some of the big challenges to democracy and humanity it is of the greatest importance critically to reflect up upon their pedagogical implications. Based on this assumption, they assert that environmental problems are structurally anchored in society and our ways of living. And thus, it is necessary to find solutions to these problems through changes both at the societal and the individual level. Thus the aim of environmental education must be to make present and future citizens capable of acting appropriately on a societal as well as personal level. The root causes and anchorage of environmental problems have many consequences for the objectives, content and processes of environmental education.

Their concern is that because the environmental problems are so enormous and the way we present them to students might lead them to anxiety that might compound the whole process of educating them; they therefore suggest that the kind of environmental education that we do should embrace a pedagogical approach that will instil in students the courage, commitment and desire to get involved in the social interest concerning the issues that we teach. It is therefore important that these students become actively involved in a democratic society by means of participation.

They describe action competence as a formative ideal in a democratic approach to education. It is inclined to being able and willing to be qualified participants. It is also coupled with actions that must be understood and explained with reference to motives and reasons, rather than to mechanisms and causes. Actions are intentional.

Jensen and Shnack promote action competence in environmental education as vital and give the following reasons for their argument:

> First, the dominance of scientism in environmental education, where the focus
> is often on giving pupils knowledge about the seriousness and extent of the
> environmental problems, has not been capable of addressing the social and

societal perspectives involved in questions about the root causes of problems and the action possibilities which are open to society and individual. Secondly awareness that moralizing, behaviour-modifying teaching rarely if ever leads to intended behavioural changes have re-focused attention on action in teaching. Third, growing criticism of schools because of the priority they give to academic dimension at the expense of the more practical has led to increased attention being given to action oriented approaches. Fourth, Criticisms of simulations, games, role plays etc. and they often artificial as if situations, has led to increased demands for authenticity and thus also for participation in the reality of society as part of teaching (1997: 167).

Even though these perspectives are from Denmark, their implications are obtainable in Africa and South Africa for that matter. These ideologies would form a greater part in influencing a pedagogical approach to environmental education if transformation and sustainability in environmental education is to be achieved. These elements also need to form part of teacher professional development in environmental education because they have a capacity to broaden and open up educators minds to a critical approach to environmental education and transform the way we practice environmental education.

In the next stage I want to briefly describe the formalization of environmental education into the South African curriculum, to provide a broader understanding of the processes of this formalization and then I will look specifically at the particular outcomes that are reflected in life sciences with regard to environmental education. It will also be important to look at the trends of implementation of those outcomes in relation to the environmental paradigms and approaches in education. In a nutshell I will try to review the processes that an Ideal environmental education should go through, and then look at the paradigms that inform the South African curriculum.

The information gathered so far, will help professional developers in this field to engage in and plan appropriately and critically in the implementation of professional development of educators in general.

### 2.3.2   Development of Environmental Education in South Africa

This section will trace the formalization of EE in the curriculum of South Africa. This understanding is vital as it will help trace the position and progressive innovation that is put into professional development of teachers in this field.

Lotz Sisitka outlines this clearly as indicated below:

- Environmental education policy initiative (EEPI) - introduced participatory policy-making process to environmental education curriculum work in South Africa just prior to and after the first democratic election (Sisitka, 2002, p.97).

- The environmental education curriculum initiative (EECI) – a state- civil society partnership project (1996–2000) enabling staff from the Department of Environmental Affairs and Tourism, provincial government education departments and environmental education in the emerging new schools curriculum known a Curriculum 2005 (Janse Van Rensburg andLotz Sistika 1977; Lotz Sisitka, 2002, p.98).

- The learning of a sustainability pilot project – a donor-funded pilot project (1997-2000) which focused on the professional development of teachers enable them to enhance their skills for learning programme development in a context of rapid curriculum change in two provinces (Lotz-Sisitika & Janse van Rensburg, 2000)

- The National Environmental Education project for General Education and Training (NEEP-GET) - a large-scale donor funded initiative (2000-2002) aimed at providing professional development to curriculum advisors and teachers to enable the integration of environmental learning in schools. This project operates in all nine provinces (NEEP-GET project document, 2002; Lotz-Sisitka and Raven, 2001).

- The above initiatives represent the major national curriculum intervention in the environmental education curriculum development work between 1992 and 2002. Post-apartheid political transformation gave rise to a radical re-orientation of the role of education in South African society (Lotz Sisitka: 2002:97-98).

From the above development, I find it interesting to venture into the understanding of how the National Environmental Education Policy was established and how the fundamental establishment enhanced teacher professional development. A venture that I find useful in defining the contextual factors that influence and underpins professional development programmes in South Africa.

### 2.3.3 Review of Professional Development of National Environmental Education Policy in General Education and Training Project in South Africa (NEEP-GET)

I have outlined the various events that necessitated environmental education in South Africa. I will now discuss a specific programme project that was developed by the National Environmental Education Policy in the General Education and training phase in South African Education. This project was aimed at professional development of environmental education.

Ashwell (2000, p.43) reveals that,

> In teacher development Programmes in the 'new South Africa', one experiences vividly the tensions of transformation. Teachers, administrators and teacher support staff want to realise a different system that has majority support, but they are constrained by their context and capacities having been constituted in the sediment of the past (Ashwell, 2000, p.43).

#### 2.3.3.1 Background knowledge of the NEEP-GET Programme

This programme was set up in the year 2000 by the Minister of Education to foster capacity for environmental learning in South Africa's curriculum. It was done purposefully to buttress the policy of human rights in the South Africa's Constitution that protects the rights of all South Africans and provide a healthy environment. This underscored the need for sustainable management of South Africa's resources, for current and future generation. This implies a framework for sustainable development into South African policy. The project aimed to developing the relationship between human rights, social justice, inclusivity and a healthy environment.

The programme has made efforts to guarantee South Africans environmental learning in an integrated form throughout the curriculum while fostering competence in the provinces to facilitate environmental learning in South African schools.

#### 2.3.3.2 Strategies

They used the following strategies to accomplish their goal;

- They assumed a programme to integrate environment in the GET curriculum statements
- They launched and put into operation a professional development programme for provincial coordinators, allotted them with coordinating environmental

education and made available INSET in the Provincial Departments of Education

- They set up and executed environmental education professional development programmes for provincial and district curriculum support staff.

- They instituted and put into practice environmental education professional development programmes for teachers

- They expanded and created guideline documents and resource materials to support environmental learning

- They took the responsibility of a program to support the amalgamation of environmental education in pre-service teacher education programmes

- They enhanced harmonization of school focused environmental education proposal at national and provincial levels.(NEEP-GET, 2005, pp.1-2)

- From the above strategies, it is of interest to this research to see how they established and implemented the professional development programme that they planned for teachers.

### 2.3.3.3 NEEP-GET's Approaches to Professional Development of Teachers in Environmental Education

#### 2.3.3.3.1 Historical background

It is vital at this stage to understand the context in which this PD programme was operated. This professional development programme was driven by the change in curriculum policy in 1996 which required that South African teachers had to fit in place with the new curriculum policy in, consequential, ways that would transform education in South Africa. The revision of C2005 required more advanced professional development of educators. Moreover, this programme came at a time when South African education needed transformation. This transformation demanded that teachers be seen as professionals and not technicians and opportunities were to be allowed to teachers to ensure critical competencies and make decisions about their own practice. This epistemology introduced notions of process-based professional development that aimed at empowering teachers to critically review and engage with the oppressive structural factors that had impeded their professional practice (Janse, van Rensburg, 2000, pp.4-5).

This professional development was also anchored in the norms and standards of the educators' policy in South Africa that demanded new roles and proficiencies for educators. The policy demanded that professional development programmes are to foster practical

foundational and reflexive proficiencies, conceptualized and applied competence. NEEP-GET project considered professional development through accredited professional development processes.

To achieve this they ventured into a pilot research project that informed them about the approach to professional development. It is on this background that the learning for sustainability project was built and modelled for in-service teacher education.

### 2.3.3.3.2 Learning for Sustainability in Focus

This programme was established in Mpumalanga and Gauteng for classroom teachers in process of curriculum and resource material development for environmental education. The project *aimed* to: help teachers to move from a content-centred to an outcomes based approach to teaching; exemplify and disseminate learner centeredness; support teachers in processes of action reflection as a basis for curriculum development and solving curriculum problems; utilize action research as a mechanism for diagnosing and solving curriculum and professional development problems and be participatory (Janse van Rensburg, 2000, p.41).

The project strategized to use a spiral model of teacher professional development in learning for sustainability. They came to this decision when they reviewed the training that was done using the cascade model of teacher training in curriculum 2005. Janse van Rensburg (2004) notes that the discussion with teachers and teacher support staff exposed problems that arose as a result of using this method.

They noted that much weight was laid mainly on vocabulary and structure; educational processes were dealt with through unsophisticated dichotomy out of the old in with the new; the sessions were not well held up with high quality materials; there were obvious and evident gaps where the details seemed not to have been thought through by those starting the cascade; the duration of the training was too short; there was virtually no on-going support and development when teachers were back on the site after receiving orientation and training at workshops and trainers failed to apply lessons learned from piloting. The Cascade program is seen as a technicist approach to teacher development. This is because it pivots on in sequence information for highly structured processes that are focused on information transfer; a separation between the information and classroom practice and teachers' theories about that practice.

In piloting learning for sustainability spiral model was adapted from the cascade model which was used in Namibia for life science programmes. This progressive theory of teacher

development in Environmental Education is necessitated by a need for change. Van Rensburg, (2002) purports that education that reproduces modernism uncritically cannot effectively be engaged in resolving the crises modernism has created, and that for education to fulfil its potential as an agent of change towards a more sustainable society, sufficient attention must be given to education as the subject of change itself (Janse Van Rensburg, 2002, p.46)

Moreover, Janse Van Resburg incorporated Robbotom's principles of professional development in environmental education that promotes environmental education as enquiry - based, participatory and practice-based; critical in terms of values and assumptions that inform and justify EE policies; community-based and collaborative. It was also driven by the notions and ideologies that see teachers as reflective practitioners, that permit teachers occasions where they can examine, evaluate and question values and pedagogies that they are trained to practice. It also facilitated teachers to think critically on their own professional development. This nullifies the view of teachers as technicians (2002, p.47).

This project also developed frameworks for teacher education that were anchored on critical and social constructionist perspectives that buttresses on process and open-enddeness in professional development activities. This process was set collaboratively with teachers as learners and room was given for relevant learning guided by context and for relevant learning to emerging from the process.

### 2.3.3.3.3 Features of the Spiral model

*Long term vision of professional development;* South African teachers were allowed three years or even beyond as learning is regarded as a process. This they may have been achieved but not in all the clusters. They also developed *clusters* to stimulate *dialogue* and c*ollaboration;* this was done by the Provincial Education Departments; schools were selected from close propinquity and convenience to form clusters and teachers were also selected from each of the schools, these teachers met on a regular basis with the project staff member and any departmental staff who wanted to join them. Attendance in these clustered meetings varied in some cases but was generally regarded as satisfying.

These clusters optimized collaborations and collaborative learning and made it possible for constructivist strategies to function well. The duration of the training spoke aloud as teachers and subject advisers who were involved were able to go into depth with curriculum issues and with issues associated with educational transformation (NEEP-GET C2005). Even though there were successes, the project developers battled with issues of time frame for teacher

professional development. As compared to the time and professionalism which accompanied the sessions and the available funds in the NEEP-GET, it was critical as to whether the same context would be available for future continuing PD for teachers in environmental education in other provinces. Trust, confidence and competence were those qualities that enabled this program to thrive and one wonders if or how this can be inculcated upon the provinces for the continuous and successful PD programs they envisioned.

The *integration of NCS(R-9)* and the NEEP-GET project arose as this was the time when South Africa was experiencing change this integration consequentially affected the content for teacher development projects that they needed to employ.

*Work together work away***:** At this point, these clusters comprised meetings and study tours, in which the groups 'worked together' interspersed with periods in which pairs or individuals were to work away in the classroom context or on homework activities. These activities are said to have encouraged working through the ideas introduced in the meetings, applied and extended what was learned at from the meeting; and engaged inquiry into their own contexts as preparation for work to be done in the follow-up meetings.

The *challenge* that they experienced in the *work away* sessions were seen when the activities provided during the sessions were not connected to practice. The dispute here was to be able to strengthen the activities to be in line with the teachers' context of practice in order to sustain this model.

This process was equipped with resources and very highly qualified professional development facilitators that provided the services. The uncertainty was that the less ideal situations in the provinces might not be able to render such training if the context of the demonstration was different from where the project was to be implemented. Moreover the project facilitators of this project struggled to allocate budget and planning to the provinces which proved very cumbersome, and transferring these contexts to the districts became a huge predicament. Therefore if such programmes are to run in the provinces or local school district, then contexts of such environments of learning should be put in place to necessitate the possibilities of such PD, otherwise partnership becomes the ideal. In the transfer of curriculum support of staff clusters to teacher clusters, there was verification that this was only effective when additional departmental support was made available. The use of workplace skills and development fund or partner-based support or where teacher clusters focused on learning area of subject advisors were more established and this raised questions of a possible continuous sustainable PD programme for future EE educators.

### 2.3.3.3.4   What the programme achieved

The programme contributed to the knowledge of professional development in environmental education in the sense that it allowed participation, transformation, effectiveness, relevance and sustainability in professional development.

### 2.3.3.3.4.1   Participation

In *participation,* the project revealed that for any professional development to be successful, activities planned should take cognizance of individual educator/participants needs, which must be understood and considered in context. This process must also be viewed as a continuous process. Individual inputs were valued as well as their outputs. Participants were encouraged to be actively involved in the whole process.

### 2.3.3.3.4.2   Transformation

This was experienced in terms of being able to interpret and implement education policy.  It was specifically geared towards environmental education. The project also held up in the deeper understandings of the underlying approaches of outcomes of education. The kind of learner that is pictured by the educationist was pivotal in the interpretation of this PD. The diversity and the nature of the participant involved was also a transformative aspect experienced by this project. This program also facilitated critical connections with confidence in wide range of issues that required integration in the PD in education locale. Specific to this transformation was the epistemology of "Interpretation of education policy and the cultivation and promotion of an appropriate teaching ethic congruous with proficiency" (NEEP-GET: 2005, p.24).

### 2.3.3.3.4.3   Relevance:

This program signified relevance in the provision of openings that was a focal point to the requirements of curriculum support staff that were to cascade their experiences to teachers through their dealings with teacher clusters (NEEP-GET: 2005, p.24 ). Even though their needs were different from those of cluster teachers, this project lit the fire of trainings of teachers within the closing phase of the PD project.

### 2.3.3.3.4.4 Sustainability:

The location of the project gave it precedence and the national Department of Education provided it with ideal opportunities for learning from the project to be incorporated and strengthened in gathering professional development processes to be undertaken with the department. The fundamentality of its sustainability is its ability to share lessons learned within the new national framework for Teacher Education.

Other things that struck me during this research were how intensive this programme put a lot of things in place for professional development for teachers in environmental education. Apart from the processes in which they engaged with the teachers, they went further to develop resources that would assist teachers in their action projects. Some of the projects they put in place to support environmental education in the curriculum included learners, learning and teacher-learner relationships guides which were used to facilitate understanding learners' contexts, classroom relationships, and how to create a learning environment while exploring learning(NEEP-GET, 2004). Critical thinking shaped a learning space for professional development in environmental education. Besides, they advanced learning and teaching support materials as well as their use in supporting EE in the curriculum. In addition they worked with policy documents to exemplify the development of professional portfolios that would help teachers to reflect on a series of their growth in competence over a period of time. Portfolios also provide a collection of concrete substantiation reflecting a range of knowledge, skills values and attitudes obtained and developed through participation in either individual or collective professional development activities. The project set up a strong partnership that worked cooperatively which enabled them to inculcate and implement environmental learning in the curriculum. To crown it, the professional development programme evaluated itself in what they called 'stories of change: most significant change experiences' (NEEP-GET, 2004). The participants in this project got accreditation in certificates at the University of Rhodes and were advantaged with 24 credits carried over for their further studies, if they choose to continue in pursuing further studies in environmental education this was a motivation and an incentive for the teachers who were involved in the program.

A glimpse on International and Local Environmental Programme in professional development attracted this research, the aim of this venture into other researched PDP was for me  to be able to see and learn how international programmes can contribute towards improving the local programmes and vice versa. As a developing country, South Africa would be able to learn from countries that have been well established in professional development through

environmental education. This research also aims to discover indicators and instances that provide more opportunities for take-up and implementation in EE PD programmes.

In the next section I want to explore the professional development programme that was carried out by Papadimitriou from the University of Thessaloniki in Greece and how the PD carried by Reddy in Grassy Park in South Africa could have learned from it and how these two PDs informs this research.

### 2.3.4 Professional Development of In-Service Primary Teachers in Environmental Education: An Action Research Approach. Aristotelian University Of Thessaloniki, Greece (Papadimitrou, 1995)

In an attempt to promote professional development for in-service primary teachers in environmental education, Papadimitriou, at Aristotelian University organized an action research as an approach – teachers were engaged as researchers on their practices as part-time students. Some of them took EE as one of their courses and this encouraged them to organize courses on the same areas. The choice to involve them in action research was made after considering the factors that discouraged them from participation in EE was established.

One needs to know that EE was only taught in secondary schools through other subjects. This implied that secondary schools students were actually taught about the environment through pictures and the contents of textbooks. However, a new development emerged in Greece where primary school teachers were also encouraged to take initiative on teaching EE. Thus consultants in the field were appointed and seminars were offered to enhance the implementation, but most of the teachers were not able to grasp the potential of the offer that was given to them, especially because of their tight routine and centrally organized book-centred education system.

In line with this, Papadimitriou's (1995:pp.195-212) experience in working with primary school teachers drove him to facilitate the research process. Fourteen in-service primary teachers who took up university studies were interviewed through questionnaires to establish the nature of their course programme. It was clear in their discussions that they were sensitive to environmental issues, they did have positive attitudes toward EE and it meant something to them to transmit knowledge about environmental issue from teachers to children which would in turn create awareness of the dangers facing the environment and lead them to adopt attitudes to protect the environment. They were aware of the natural environment and refer to environment in general and only a few referred to children's immediate environment. However, in their practice, implementation was done in the classroom through discussions

involving environmental issues and visits to the museums and factories, amongst others as a recreational activity. In addition, they identified some inhibiting factors of their practice as the nature of the fixed timetable, interference by the head teachers, negative attitudes of colleagues and a lack of experience. It is paramount, from the above indicators, that teacher's professional development in EE is closely related to their change in both their conception and practice of EE.

The aims for this research were: to acquire a broader view of EE through the teachers' participation and to be able to improve their practice through critical reflection; to inquire into school settings and reflect critically upon them, trying at the same time to bring about some changes and to be empowered so as to make good use of the opportunities offered for EE through collaboration. The course was laid out in such a way that they attended classes in the evenings and on Saturdays for short lectures, discussions, readings and the presentation of data studies. They were also introduced to the concept of action research and offered some concrete examples of the subject. The resultant achievements were a transformation in their initial view of EE and improvement in their practice, changes in their attitudes and the ability to overcome obstacles. The engagement in practical research also broadened and improved their everyday practice.

**Issue - Based Curriculum Development as Professional Development Process in Environmental Education: A Case Study of Primary School Teachers in the Grassy Park Area.** The study focused on the development of a curriculum unit that is based in a local environment. The teachers involved, identified important environmental issues within that area that are related to the experiences of the children in their schools. Thus, Reddy as a researcher was drawn voluntarily by his passion for environmental issues and curriculum development. This research served as a professional development, both for the teachers and Reddy as the facilitator of this project. In this article, he outlines the processes that were involved therein. The main environmental issue was water pollution in canals and a lake in a residential area. Residents are not dependent on the canalized rivers as a water source, but the pollution of water has implications on the quality of life in the area (occasional bad odours, unsightly garbage flies and other insect problems and the ever present threat of water-borne diseases to humans and animals). This research was conducted through workshops and focused group interviews with project participants at their respective schools**.**

### 2.3.5   Problems in Grassy Park:

*Implementation and barriers to implementation*: The time factor made it difficult to implement learning programs and the school time table was set in such a way that it could not give room for environmental education innovations. There was lack of preparation time, lack of time in the school day and lack of instructional material. This could have been easy if the principal of the school had been amenable to curricular innovation (Reddy, 2000, pp22-23).

*Teacher disempowerment*: the teachers in the project were from disadvantaged communities, they had been systematically deskilled by a previous education system. Moreover, these teachers had been excluded from participation in curriculum development and proposals for the new system. To remedy this challenge, Reddy through this research, suggested professional development for these teachers through in-service, he concurs with Wade (1998) that state education agencies have ignored in-service in EE.

*The schools are poorly resourced*: the imbalance in the teacher-learner ratio was of real concern. Teachers were worried how they were going to handle an EE class in such large numbers being reflected in their classes. The behaviour of the learners was also a concern due to the poorly resourced environment in which the school was located and fear of misbehaviour if the teacher took their learners outside on expeditions and excursions.

*Challenges of collaborative participatory research in this context*: the short time that was put in the project hindered participation at some point. More time was required to enhance development of relationships if collaboration is to be effective in such research.

### 2.3.6   How the Greece experience can offer benefiting solutions to the problems in Grassy Park:

Even though the research processes were different in terms of approach and context, Greece experience has a lot of benefits to offer to the Grassy Park experience. Time would have been set aside for implementation out of the normal school time as teachers expressed tension between the head teacher and the tight schedule of the timetable. The Greece aspect of taking teachers out of the school routine and training them was of great value. This aspect resulted in the teachers being more focused. Upgrading the training into the university system was actually a motivating factor in enhancing the importance of professional development.

The teachers were involved in intensive training of the aspects of EE before they were taken into the field for research.

In the case of Greece, there was relatively enough time for teachers to bond before they were taken into the field. They worked on different projects of their choices in the various groups. They were able to deal with and tackle the problems they faced in their schools. The point of working much closer with teachers in the Greece case created opportunities for teachers to consult much more regularly to solve the problems as they experienced them - this was a factor that would have helped Grassy Park.

The teachers at Grassy Park would have benefited much more, if they could have been trained for a longer period of time with the result that they could have been more effective in teaching EE. There could have been more impact, if not for the concept of volunteering, hence lack of cooperation among the head teachers. Moreover, it would have been fundamental to involve the whole institutional structure; and probably the Education Department of the Stellenbosch University as well.

It is important to note that even though the Grassy Park project experienced some problems, the context could have been a contributing factor. However, it created an opportunity for awareness in professional development of teachers in even poorly resourced schools. It also opened room for more research in environmental education.

The two professional development programmes have contributions that will influence the evaluation of this research. Even though the contexts are different, the purposes and objectives varied. The goal of producing sustainable environmentally inclined teachers is an overarching aim for all environmental professional developers.

## 2.4  **Summary**

Professional development in environmental education is a great need for South African schools. Owing to the fact that intentional inclusion of environmental education into the curriculum is a recent phenomenon and many lack skills, knowledge and awareness of the educational approach to the ever increasing environmental crisis. Moreover the international arena declare this decade to 2015 as an era of sustainable development, thus more teachers needs to be trained both in in-service and pre-service to cope with the curriculum demands in order to raise, environmentally competent and equipped educators who will implement the curriculum and curb the ever increasing environmental crisis locally and internationally by increasing more intellectually able society. This chapter has reviewed literature to highlight the understanding of the concept professional development; the necessity of professional

development, the structural features and the models of professional development that might be helpful to consider while venturing into this field.

This chapter has also opened a window in understanding the construct environmental education, its development in South African education and curriculum and highlighted attempts in implementation. I have also attempted to expose local and international programmes that I found prominent to illustrate a composite of action projects as intervention in environmental education as forms of professional development processes that would assist in evaluating this specific PDP. Again these basic foundational reviews are geared to help me to evaluate this specific PDP, because they provide meaning to the evaluation in content, context and practice.

Evans (2002) contributes towards the nature of professional development that would bring transformation. Thus she implies that if environmental education is to thrive, then educators who go through professional development in environmental education should be able to attain to some degree an attitude change, knowledge dimension, developmental aspects, and skills. Jansen and Shnack (1997) add the dimension of action competence. Reddy, (2004) on the other hand stresses that this process of training results into democratization, where the teacher becomes confident and is able to make contributions in the field of environmental education. He also emphasizes the importance of models and the role they play in programmes, stresses the idea of models used in programmes that also play a major role. The models used should put in context the kind of teachers that are being trained.

Other important features that will be helpful in this evaluation will be structural features provided by Garet and Porter (2001, p.915-945). They affirm that, duration of the training - the time of training should be long enough to allow participation and collaboration among teachers and should be able to allow teachers to integrate new knowledge into practice. The form of activity should be able to provide teachers activities and content necessary for increasing teacher's knowledge and instil meaningful changes in their classroom practice and should allow teachers some degree of participation in a collaborative way.

# Chapter 3
# Research Methodology and Methods

3.1 **Introduction**

Mouton and Marais (1998) suggest that "the quality of research findings is directly dependent on the accountability of the research methodology followed. For this reason, researchers should fully describe the way in which their research has been planned, structured and executed in order to comply with the scientific criteria". This chapter presents theory of knowledge and the interpretive framework guiding this research study, it also includes the techniques for gathering empirical evidence that will enable me to proceed in conducting the evaluation of this professional development programme. The methodology involves the consideration of research design, data production and data analysis, and theorising together with the social, ethical and political concerns of the programme in question that also form part of this chapter. I explore the various methods of data collection, epistemological frameworks, ontological views and the research type as used in the design to present coherent evidence of the research procedures. I will also present the research question and how I intend to address the question throughout the research period. This chapter will also look at the ethical issues and how validity is maintained throughout this research.

Research problem:

Mouton (2001, p.53) describes research problems as implicitly or explicitly embodying a research question. He goes further to say, "We often formulate research problems in form of questions as a way of focussing the research problem" in view of this, I will use the questions below as the problems of this research.

The fundamental questions motivating this research are:

**Main question:**

- *How has teachers' training in Environmental Education enabled professional development of teachers in EE?*

**Sub questions:**

- To what extent has the professional development process in a Professional development programme in environmental education enabled implementation?

- How effective has the professional development programme been with regard to take-up?

How I came up with these questions is explained in detail in Chapter one. The context of the study is also explained in detail in chapter one.

### 3.2    The aim of the research

There are a number of reasons why evaluation research is done, Ann Craft (1996:58-59) identifies several reasons why an evaluation of a professional development programme is necessary. She says that evaluation is vital in accountability and development processes. This research however is concerned with the development aspect of the programme which is aimed at improving the PD programme's sustainability. As opposed to accountability evaluation, development evaluation is concerned with the stronger formative component which is more interwoven in the programme's change. This will in turn involve stakeholders who are inclined towards the change in the programme.

Therefore, this research aims and purposes to conduct a formative evaluation of the PD programme in Environmental Education in order to improve and sustain the programme. I will evaluate the extent of take-up, implementation and the conceptualization of the programme. In defining evaluation purposes, Mark, Henry and Julnes (2000, p.49) concur with the above aim when they say that, evaluation exists to improve the way that programmes and policies function, by providing information that can be used in democratic institutions to advance social betterment. They continue further by saying that, "if an evaluation is to aid in sense making about a programme or policy, a series of decisions must be made about how the evaluation will be structured and carried out. These decisions will in turn affect the extent to which this research evaluation will provide useful information for improving, overseeing, selecting, or understanding public policies and programme" (ibid, p.49).

### 3.3    Epistemological Framework

This research is informed by the interpretive paradigm, where the experiences of people count. This project therefore aims to understand and interpret the meaning and perspectives that teachers; PD Programme officials and Education Department officials give to the Professional Development Programme of teachers in environmental education in which they are stakeholders.  This in turn enables me to be able to evaluate, the conceptualization, the take-up, implementation process and the outcomes of the PD in order to improve it (De Vos et al., 2005, p.270). Charles affirms that;

> […]majority of interpretive evaluation designs are based on the assumption that different programme stakeholders are likely to have different perspectives on the programme and its development, that these differences may be indicative of different value positions and ideologies, and that understanding stakeholder perspectives is essential to understanding the programme… the departure point in interpretive evaluation design is often involves contact between the evaluator and the various stakeholders involved in the programme development. This takes form of initial visits or series of visits to the programme, followed by interviews with stake holders and in certain cases group meetings or focus groups are conducted for the purpose of informing the stakeholders on the possibility of evaluation (2008, p.415).

Interpretive paradigm acknowledges that knowledge is socially constructed, thus this research adapted Clive's ideology that it is essential in the study of people to just recognise how people define their situation in which they find themselves, "if people define situations as real they are real in their consequences"(2002, p.789).

Coleman and Briggs (2002, p. 5) augment to Terre Blanche et al. (2008) and Clive's (2002) ideology that interpretivism imbibes and encapsulate a number of philosophical traditions; it replaces 'anti-positivism' paradigm in a dual opposition to positivism. They say that it includes phenomenology and ethnomethodology and symbolizes interactions; naturalism and ethnogenics. They maintain that interpretive paradigm in the world of educational research "needs to be grounded in people's experience; for interpretivists' reality is not out there as amalgam of external phenomena waiting to be uncovered as facts but a construct in which people understand reality in different ways" (Coleman & Briggs, 2002, p.5).

De Vos et al (ibid) suggests that in order for the researcher to do this, the researcher should be able to enter the subjects "life world" or "life setting" and place himself in the shoes of the subject. This I have achieved through participants' observations; semi structured interviews and focused group interviews with the stakeholders.

Evaluation research is one of the methodological aspects that will form a big part of this research in the sense that, the researcher intends to evaluate a Professional Development Programme, in order to improve its sustainability. Understanding evaluation research at this point is appropriate as it defines the paths that I have chosen to follow in doing an interpretive evaluation. Charles (2008, p.411) indicates that one of the purpose of evaluation research is to focus on the theories of change implicit in social programmes, and to analyse the ways in which those involved in the social programmes go about their work, the issues they deal with and the manner in which they confront these issues, Moreover, central to evaluation is that it is not theoretical but is focused on answering specific practical questions about social

programmes and their development, with regards to implementation and outcomes as well as quality of service provided.

Thus, this research depicts what De Vos et al. (ibid) would term, an '*interpretive phenomenological evaluative epistemology*" (Emphasis added in compound word). Babbie and Mouton appropriates the conditions for this research as a naturalistic evaluation which they say is best done under the following conditions:

- When it is necessary to gather contextual and detailed knowledge of an evaluand before finalizing the evaluation design.

- When it is important and desirable that the insider perspectives, values and the knowledge of programme recipients need to be integrated into an evaluation design.

- When the focus is more on describing the implementation process rather than on the outcomes or impacts of an intervention

- When the purpose of the evaluation is formative and developmental in nature.

- When it is important to study the intervention in its natural setting and preferably through its entire cycle.

- When it is possible to use obtrusive measures, including simple observation and the analysis of documents in an ethically acceptable manner.

- When the ultimate quality of the evaluation will be produced through a triangulation of data sources and the use of multiple methods.

(Babbie and Mouton, 1998, pp.354-358)

The conditions Babbie and Mouton (1998) describes above suited this research project except for the fact that this evaluation has researched an existing programme. It was a programme; that had started before I began my investigations and research; I did not form part of the entire life cycle of the programme but seeks to understand the Cycle and evaluate it. Thus, understanding this programme forms a vital role in evaluating this programme. Therefore, I used interpretive methods, and ideologies to understand from the stakeholders' perspective of the programme progression to date in order to do a formative evaluation.

To do this I did a series of evaluations 'going back and forth and again' through inquiry in order to understand. As mentioned earlier, this research is largely an evaluative one. The processes that I intend to follow are drawn from extensive literature that I studied on the subject and I came up with a hybrid that I formed from several authors. The chart below

describes the phases of this evaluation. I read extensively and realised that not all the frameworks given by scholars fitted exactly into my research. So what I did was to choose aspects of their work that are applicable to this study and made a hybrid of what fitted into my study and context.

Step:
1. Evaluand
2. Specify objectives of evaluation Specified
3. Identify Stakeholders
4. Choose research design
5.Analyze/Interpret Findings Report/ Implement results.

**Phase 1:**
Clarificative evaluation (programme theory)

**Phase 2:**
Interactive evaluation

**Phase 3:**
Programme Monitoring- (process evaluation)

**Phase 4**
Impact evaluation

Phase 5:

Utilisation/Implementation

Diagram 3.1: Phases of evaluation:

De Vos, Strydom, Fouche and Delport (2005, p.370) illustrate an integrated model of Programme Evaluation as shown above, alterations and integration have been made through hybridizing[3] the works of Rossi, Lipsey and Freeman (2004); Owen and Roger (1999);

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[3] Coleman and Briggs (2002:9), explains " hybrid method" of research when they say that, other researchers deploy a hybrid approach in which problems may be conceived primarily as a 'sociological' or 'psychological'; the whole panoply of theoretical discourse derived from specific disciplines is then applied to the research problem…" they maintain that theory can serve purposes of direct response to a guide to help solve problems

Babbie and Mouton's (1998) types of evaluations together with Craft's (1996) ideology of programme theory before evaluation. Additionally the steps have been altered to suit this research processes:

Phases:

The chart above shows the research phases that I followed in order to answer my research questions short explanations follows to further understand the diagram above.

Phase 1: Clarificative research:

- Clarified internal structure and functioning of a programme.
- Highlighted theory and logic of a programme and policy.
- I worked with policy and programme staff themselves.
- Preliminary data were collected and are partially presented in the steps below. This was vital for planning the evaluation.

Phase 2: Interactive:

- Provided information about delivery and implementation of a programme;
- Enabled me to look through the programme documentation and incremental improvement of innovation in the programme;
- This provided me with findings and allowed me to facilitate learning and make decisions on how to design this research and its final shape.
- Supported programme's research evolvement and changing shape of the findings;
- Lead me to provide information oriented for improvement of this programme.

Phase 3: Monitoring

- Was appropriated for an on-going and established programme;
- Was used to understand staff awareness of specified goals or intentions of the programme.
- Was used to evaluate involvement of developing a regular monitoring of the programme and support systems.

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posed within a particular perspective or more reflective upon the processes of theorizing itself, to become clearly aware of the perspectives which give rise to theorizing…

- Was used to determine systematic evaluation of take-up in the programme, in order to meet the program target and goals.

Phase 4: Impact

- It was used to assess the impact of the programme.
- Assumed logic end point analysis.
- Established merit or worth of a programme and the recommendations thereof.

Phase 5: Utilization/implementation

- Helped diagnose how the programme plan was put into action.
- Helped to determine the take-up of teachers.
- Was used to evaluate implementation of action projects.
- Was used to explain how the findings of this evaluation will be utilized
- Was used to explain how the information generated through this evaluation will be utilized.
- Helped explain how utilization of the research findings can help improve the programme.
- Helped to translate the findings of the research into useful information for improvement.

Steps in process:

Preliminary data that were collected for the research proposal and design of this chapter followed the steps below as illustrated using one of the phases (Clarificative evaluation) mentioned above: The explanations below presents specific programme theory that I gathered as preliminary information from the PD organisers and the programme documents. This I did to give clarifications I needed to plan this chapter and enabled me to determine the value [worth] of this programme. Only partial presentation of these steps is presented to illustrate them.

1. What was to be evaluated?

This research will evaluate the extent of professional development that is offered by a specific PDP in FET programme to life science teachers within specified geographical locations as indicated in the objectives. This research will also evaluate the take-up of teachers of the PD

programme and the conceptualization of the PDP as well. The evaluand therefore is the PD programme.

2. Identified Stake Holders

In this section, I identify the stakeholders as the teachers who are the main participants in the programme, the organisational level are the PD program officials, and the education department officials. These three stakeholders have helped the researcher to understand conceptualization, the extent of implementation, the extent of take-up of the PD programme and the progress in professional development of environmental educators.

3. Specified programme objectives

The PDP's main objective is to: "develop global environmental educators through a capacity building pilot programme with a cluster of life sciences educators within the Further Education and Training (FET) band from 10 schools from two Education Management District Centres …" (Proposal to Funders, October 2007).

To achieve the above objective the programme has outlined 6 workshops' objectives that are discussed further in chapter four; data presentation and analysis. The above description is partially done through one of the in the steps in process just to illustrate the processes the researcher involved in addressing the research questions and how this research was conducted. These processes describe the understanding steps in processes that I used and are displayed more in the next chapter of data analysis. I drew on De Vos et al. (2005); Rossi et al. (2004); Babbie and Mouton (1998); Owen et al. (1999) and Spaulding (2008) to develop the processes above. In other words they formed the episteme of the evaluative process.

### 3.4 Research design

Mouton and Marais (1990, p.193) explains that a research design is an exposition or plan of how the researcher decides to execute the formulated research problem. "The objective of the research design is to plan, structure and execute the project concerned in such a way that the validity of the findings are maximized" (ibid).

Creswell (1998, p. 2) defines design as "the entire process of research from conceptualizing a problem to writing the narrative." De Vos et al. (2005, p.268) argues that in quantitative research, researchers use certain tools and guidelines that are given to them, however, in qualitative oriented research the researcher is free to consult the various lists of designs

available and is free to choose whatever design they want or develop as design as they go along. Babbie and Mouton, (1998, p.72) however, sees design as addressing the planning of scientific inquiry – designing a strategy of finding out something. They say that this design varies depending on what one wants to study. It follows that one must state out clearly what it is that you want to study.

This research as I envisioned, is an interpretive evaluation research. The design follows a design of an evaluative research within the interpretive paradigm – because I wanted to understand the programme first, just how the participants describes it through their experiences of the PD programme and then evaluated it. It was important for me to describe, using literature, what evaluation research entails, the processes involved in evaluation research and in order to put this research in focus. I thought it helpful at this stage to understand what evaluation research involves:

### 3.4.1 Context of the Research: Evaluation Research Explained/Stakeholders Identified

Mouton and Babbie (1998, p.335) indicate that evaluation research is mostly referred to as programme evaluation because it is more a research purpose than a specific research method. The purpose is to evaluate the impact of social interventions such as new teaching methods, innovations in parole and wide variety of such programmes. In quoting Rutman (1984, p.10), Mouton says that "programme evaluation entails the use of scientific methods to measure the implementation and outcomes of programmes for decision-making purposes" (1998, p.335). However, evaluation research has been confused with intervention research. De Vos et al. in making this distinction states that;

> …using pilot tests and field replications to test and refine the intervention, sets intervention research apart from … 'mere' programme evaluation" [he goes further to say that] "In our opinion, however, the 'mere' crucial characteristic which distinguishes intervention research from "mere "programme evaluation is not so much of the uses of pilot test or …that when an intervention research is attempted, something new is created and then evaluated. But in the case of programme evaluation assumption is made that there is prior existence of a programme or an intervention designed and developed by someone else, perhaps long before the evaluator ever entered the field (2005, p.367).

This distinction is helpful because it mirrors what this research intends to do. This research is an evaluative study with the purpose of evaluating an intervention, made by a PD programme to train teachers in EE in order to raise more and effective environmental educators in FET life science educators. This is necessitated by the myriads of curriculum reforms and changes

that have taken place in the South African curriculum and the global need to educate for sustainability.

Since this programme is an intervention that already exists, this research endeavours to evaluate its effectiveness in professional development of environmental educators and probably increase/improve the sustainability of the programme in an interpretive way.

Patton (2002, p.10) defines programme evaluation as a systematic collection of information about the activities, characteristics and outcomes of a programme to make judgements about the programme, improve its effectiveness and or inform decisions about future programming. He adds that broadly it involves any effort to judge or enhance human effectiveness through systemic data-based inquiry. Rossi et al. (2004, p.16) define programme evaluation as the use of social research methods to systematically investigate the effectiveness of the social intervention programmes in ways that are adapted to their political and organisational environments and are designed to inform social action to improve social conditions. Craft (1996), quotes Aspinwall et al.'s (1992) definition of evaluation which he says is neutral and representative, he adds that evaluation involves processes like asking questions, gathering information, forming conclusions about programmes and their implementation in order to make recommendations as a basis for decision making. He says; "Evaluation means placing a value on things…it involves making judgments about the worth of an activity through systematically and openly collecting and analysing information about it and relating this to explicit objectives, criteria and values" (1996:71).

Mouton, Rossi, De Vos et al. and Patton's descriptions above depict the aim of this research. This research will mainly conduct a formative evaluation with the aim of improving the PD programme. According to Babbie and Mouton, (1998) formative evaluation is done to provide feedback to people who are trying to improve something. The evaluations also included the elements depicted by Craft (1996) above. The implementation of this programme also required evaluation; Babbie and Mouton (ibid) assert this when they say that even if the outcome of an intervention are not evaluated, the implementation process still remains necessary for evaluation. This Rossi and Freeman (1993, p.212) elaborate as "a systematic assessment of programme coverage and delivery" (Babbie and Mouton, 1998, p.345).

Several scholars have described evaluation research in diverse ways. Some have separated the various ways of conducting evaluation for different purposes as formative or summative, others have referred to it as impact assessment, outcome assessment, implementation assessment or process assessment and programme monitoring. This research intended to do an

evaluation for improvement, and envisioned that the conceptualization, implementation or process evaluation and the outcomes (take-up) of this programme determine how this programme can be evaluated. That is why even though I refer to the programme implementation; also refer to conceptualization of the objectives, curriculum planning and the outcome of the workshops. The researcher asked questions like: did the experience of the training result in meaningful actions which are imagined to have been the ultimate goal of the programme as specified in the objectives?

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Permission was also granted by the PDP Officials to allow me to use their documents for analysis in order to understand the theory that operates the program. In evaluating the conceptualization of the program, this research endeavoured to seek information on the program goals and objectives, program functions, components, activities, and the corroborating description of the program theory. Conceptualisation of the program created a platform that enabled the evaluation of the implementation and process monitoring for the envisioned improvement.

Owen and Rogers (1999) describe evaluation as "processes of negotiating an evaluation plan; collecting and analysing evidence to produce findings and disseminating the findings to identified audiences for use in describing  or understanding an evaluand; or making judgements and/or decisions related to that evaluand" (1999, p.4). They go further to substantiate the objects of evaluation as: Programs; policies, organisations; products and individuals. From this list, I was interested in evaluating a programme; the entire program that provides PD to life science teachers through an environmental education perspective. A programme according to Owen et al is "set of planned activities directed toward bringing about specified change(s) in an identified and identifiable audience". This proposes that programme has two essential constituents: a documented plan; and an action consistent with the information contained in the plan. By the same token, this evaluation research has followed the following conceptual framework which has been adapted from Babbie and Mouton (1998) with alteration and integration of ideologies explained above in order to suit this specific research path that I followed.

| EDUCATION DEPARTMENT OFFICIALS (SUPPORT AND MONITORING) (b) | ←→ | SANBI programme components (ORGANISATIONAL PROCESSES) (a) | ←→ | TEACHERS (PARTICIPANTS IN PD) (c) |
|---|---|---|---|---|

PROFESSIONAL DEVELOPMENT PROGRAMME FOR TEACHERS (1)

INTENDED OUTCOMES/ CRITICAL SUCCESS FACTORS/ BENEFITS (2)
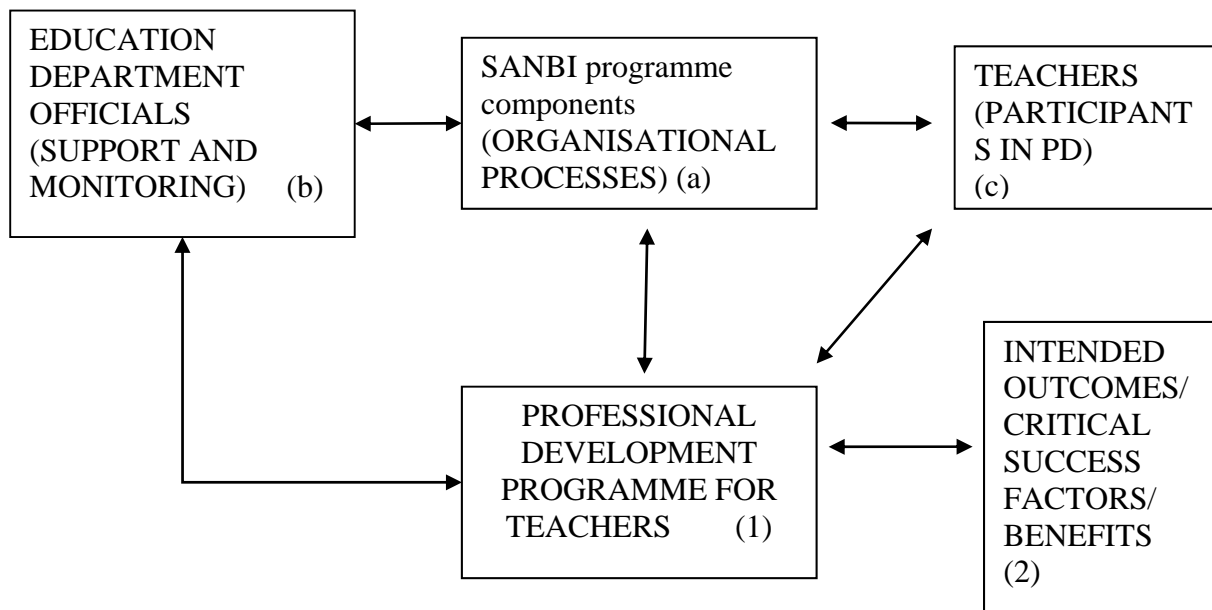
Diagram 3.2: Design Context of the evaluation Research and processes (Adapted from Babbie and Mouton, 1998, p.343)

## 3.5  Data Collection

### 3.5.1  Data/Information Sources

Mouton and Barbie (1998, p.347), expresses that most books on programme monitoring or process evaluation identify three main sources of data for the implementation evaluation studies as: Records, observations and self-reports. Records he says can be narrative in form such as field reports or highly structured data which have more comprehensive discussion of methods of measuring programme implementation. Observational methods include more systematic forms of observation as well as more unstructured forms of participant's observation and then Self-reports he says refers to all forms of interviewing people who are involved in a programme. The interviews he encourages should be conducted with project staff as well as with all other stakeholders.

Similarly, the researcher intends to collect data through semi-structured interviews and biographical questionnaires from eight teachers who have been involved in the PD programme, two project officials who have directed, planned and executed the training sessions, and three education officials who have been involved in the selection of teachers and more that will be discussed later in the research data analysis. I looked at the program records-, and found that they were well maintained record systems that helped me to estimate

programme bias or over coverage. For example program intake may be tabulated to determining where the units served the ones specified in the program's design (Rossi, Lipsey and Freeman, 2004, p.190).

To help measure target participation, the main concerns were that data were accurate and reliable. To ensure reliability of these records, the researcher ensured that the data given are not out-dated or incorrect. Member checking was ensured. Documents analysis formed part of this research; these documents included curriculum documents, attendance registers and workshop course contents and outlines. Other relevant materials that was also available for analysis including review reports and teachers' artefacts. Similarly, the researcher will observe a feedback session that the programme will have with teachers later in the year (2011).

### 3.5.2   Data Collection in the Design Stage

At the design stage, several meetings were held by the researcher, the PD developers, the relevant education department officials, my supervisor, Prof Reddy, and some of the teachers involved in this programme. At the initial meetings, discussions were held by the PD officials, narrating the overview of the PD programme, its conceptualization, and operationalisation of the programme. A proposal was presented by one of the PDP officials which revealed rather than portrayed an opening of evaluation research amongst others. The evaluation research caught my attention, in the meetings that followed; I had several questions regarding the programme, as a follow up to the previous meeting but I felt I needed more understanding about the programme. More information was gathered with regard to aims and objectives, the targets groups, and how the programme runs in general. In the meeting that followed, it became clear that evaluation was a necessity. This led to me scheduling two meetings with PDP officials for a briefing and orientation with the project. More information was gathered: with regards to how the programme runs, the content of the curriculum, the participants, history of the programme, a bit on sponsorship and general objectives and aims of the PD Programme. This further necessitated my proposal writing, which also prompted more meetings. After the proposal stage, in order to set the interview questions, I had a phone call conversation with the PDP officials in order to gain more knowledge about the schools involved, educators that formed part of the PD, the number of schools, the feedback sessions etc.

### 3.5.3    Techniques of Data Collection

The following are the techniques that will be used throughout the research**:** Semi-structured interviews; biographical questionnaires; document analysis; focused group interviews; and observation of final conference with teachers and the PDP officials on feedback of the planned projects from the workshops.

### 3.5.4    Methods and Context of Data Collection

#### 3.5.4.1    Context:

I went to the schools, on appointments and conducted my interviews with, the teachers that were selected as part of the PDP participants. Education Department officials were interviewed in their departmental offices. The PDP officials were interviewed at their offices as well. Focused group discussions were held at Stellenbosch University, PD programme offices and in selected schools.

#### 3.5.4.2    Methods

**3.5.4.2.1    Semi Structured Interviews**

Data for this research was collected using qualitative interviewing and the semi-structured interviewing process. Babbie, (1998, p.289) defines a qualitative interview as an interaction between an interviewer and a responder in which the interviewer has a general plan of inquiry. Berg (2009. p. 107), on the other hand says that this type of interview involves the implementation of a number of predetermined question and special topics. The qualitative interview is based on a set of topics to be discussed in depth rather than the uses of standardized options. This is vital to the researcher because research studies that are qualitative are designed to discover what can be learned about some phenomenon of interest, particularly a social phenomenon where people are the participants. Berg (2009) adds that these questions are asked in a systematic and consistent order, but the interviewer is allowed to digress. Berg (2009) insists that the questions used in the interview must be put across in the language that the respondents will understand the questions as used in this research observed this. The interview questions stemmed from the main research question; a copy of this is supplied at in appendix 2.

This research has adapted Babbie and Mouton's outline of the seven stages of the complete interviewing process (1998, p.290)

- Clarifying the purpose of the interview and the concepts to be explored;

- Laying out of the process through which you will accomplish your purpose including a consideration of the ethical dimension
- Doing the actual interviews
- Creating a written text of the interviews
- Determining the meaning of gathered materials in relation to the purpose of the study
- Checking the reliability and validity of the materials
- Telling others what you have learned.

This research used focused group interviews, for triangulation of data, biographical questionnaires, and observation of teachers' feedback at PDP. (To be explained further)

**3.5.4.2.2    Focus groups interviews:**

Berg (2009) posits that focus group interviews give the researcher an opportunity to observe how the participants socially construct knowledge in much detail in their attitudes, opinions and experiences. Focused group interviews were conducted in cases where two teachers from the same school attended the same training programmes. As I went into some schools, I discovered that more than one teacher attended the PD programme during the same period of time. Focused group interviews were also conducted at the management level of the PD. While this was done, a number of factors were put into consideration as depicted by Berg (2009): clearly defined objectives and the research problems were explained to the respondents; the nature and the size of the group were put into consideration. The highest number of participants in the focused group discussions was two.

The focus groups interviews were conducted in a natural environment where teacher's work and where they felt comfortable. I acted as the facilitator and the researcher at the same time because the groups were manageable; I had predetermined questions at hand and follow up questions were also conducted based on the respondent's response to the questions. I assured the respondents of confidentiality during the interviews and that the data collected would only be used for research purposes and where I require using information given by the respondents, names will be changed and that anonymity will be observed with any data that might be identified with a specific respondent's anonymity will be observed. This allowed respondents to participate freely and they disclosed their feelings and information as asked by me through research questions. They were also given a form (appendix 3) to sign and fill in as a seal for confidentiality and opportunities were granted to the respondent to withdraw if they wished

to. The data was recorded on tapes; transcribed and I used thematic analysis in a systematic way in analysing the accrued data as will be seen in the next chapter.

### 3.5.4.2.3 Observations

I was to observe a conference session, as teachers were expected to give feedback on their projects so far. This conference was to be organised by the PD providers. I was to attend as an observer with the hope that this was going to inform the implementation progress as a triangulation of data, and also to decode take-up. Unfortunately these feedback sessions did not become reality which the PDP providers attributed to time. However, I did observe the teachers' artefacts in their classrooms and school environment during the interviews. This enhanced my data collection as a triangulation of data.

### 3.5.4.2.4 Document analysis

Documents such as attendance register, workshop materials and schedules, curriculum documents for the PDP, teachers work and projects for the period of training and implementation process, students work and, PDP reports were observed and analysed.

### 3.5.4.2.5 Biographical Questionnaires

Biographical questionnaires will be used as a triangulation of data but also to get biographic information of the teachers, PDP officials and education department officials, as this aided data interpretation and analysis.

## 3.6 Research ethics

Berg (2009, p.60) asserts that a researcher doing qualitative research need to observe ethical issues because we plunge into the social lives of our respondents. Therefore researchers must ensure rights, privacy and welfare of the people that form part of their studies. Based, on my data collection methods, I assured my respondents safety, privacy, confidentiality and anonymity and informed consent in order to participate in my research. Permission was also granted by way of a letter from the PDP officials in order to use their documents for analysis. The Stellenbosch University demanded the proposal and all the research procedures before giving the mandate to begin this research.

This was followed by informed consent from the respondents were informed consent forms were explained and signed (copy displayed at the appendix one).

3.7 **Reliability and Validity**

Le Grange (2009, p.7) defines validity as "a test that measures what it is supposed to measure". There are several validity types but this research will adopt *Content validity* that measures the extent to which a test is representative of the domain that it is supposed to be testing; *predictive validity* that concerns the extent to which a test score correlates with those of a different task performed at the same time, and triangulation.

Van der Riet and Durrenheim (2006, p.91) describes validity as the degree in which the research conclusions are sound and that this validity is realised as the researcher is conducting research notably in qualitative research. One way of ensuring validity is triangulation of data. This Kelly (2006, p.344) explains involves collecting data in as many different ways or methods from as many diverse sources as possible. Gray (2004p, p.33) states further that triangulation may also involve different sources, methods, combination of methods such as interviews, observations, questionnaires and the like.

Several meetings were held, and discussions were made about the project as a preamble to the research. I visited the site, where the training took place, interacted and sought information with regard to the programme, and asked what their needs for evaluation were. As indicated in the research problem description, the above problems became clear. I used triangulation of data, met the project director and the assistant and confirmed the need for evaluation. The PD officials were very enthusiastic about the evaluation and expressed that this would be the first time they are evaluating the programme and they were willing to involve me in this very research. I wrote a proposal and sent it to them to confirm the programme's objective, which was asserted. I visited the programme manager for a few lecture periods where more in-depth information was given, thus enhancing the writing of my proposal even more. We had preamble discussions with the PD developers (administrators), some of the teachers who have been involved in the project, an education official and my supervisor; this was a forum that brushed a lot of issues around the programme as a whole. It is from these meetings that the need for evaluation arose.

In writing my research questions triangulation of data was also used. Member checking was one way validity was ensured; I read my questions to several colleagues and family members in order to ensure validity and reliability of this project.

Thick descriptions are used in the analysis of data, as gathered through interviews and focused group discussions. I used thick descriptions of data to ensure validity.

### 3.8   **Data analysis**

Data will be analysed using the thematic analysis. I wish to describe thematic analysis briefly before explaining the route of thematic analysis that I wish to follow in my analysis. A brief explanation follows as described by Braun and Clark (2006) "Thematic analysis is a method for identifying, analysing and reporting patterns (themes within data). It minimally organises and describes data set in-depth. However it frequently goes further than this, and interprets various aspects of the research topic" (p.79)

In my pursuit for an appropriate analysis for this data, I looked into lots of literature on data analysis methods and choose to work with thematic analysis which Babbie and Mouton classifies as content analysis method (2001). Many scholars have been shaky and unstable about the authenticity of *Content analysis* (Braun and Clark, 2006, p.70) as a method of data analysis. Moreover, Braun and Clarke (2006) affirms this when they say, "it can be seen as a poorly branded method, in that it does not appear to exist as a 'named' analysis in the same way the other methods do" (p.79) However, they argue to promote, elevate and theorise thematic analysis when they postulate that a lot of methods of analysis are essentially thematic. Exposition is convincing enough to consider and try using in this research. Even though many scholars recommend *grounded theory*[4] as the best method for evaluation research, I resort to use thematic analysis in this research because it describes the processes that I want to engage in as I do my analysis. Braun and Clarke emphasises that, there is no ideal theoretical framework for conducting qualitative research, or one ideal method (2006, p.80). What is important is that the theoretical framework and methods match what the researcher wants to know and that they acknowledge these decisions and recognize them as choices because of time and space I use the thematic analysis. Moreover, I concur with Braun and Clarke (2006) that in my deciding to use the "named" and the "claimed" thematic analysis, I subscribe to it because the implicit theoretical commitments of *grounded theory*, I do not wish to produce a fully worked up-grounded-theory analysis (p.80). Braun and Clerk (2006) also note that even though thematic analysis has been widely used, there has been no clear agreement about it and how one should go about it. However, they gave clear theoretical guidelines of how researchers can go about thematic analysis and these processes I find very

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[4] "A grounded theory is one that is inductively derived from the study of phenomenon it represents. It is discovered, developed and provisionally verified through systematic data collection and analysis of data pertaining to the phenomenon. One does not begin with theory, and then prove it rather one begins with an area of study and what is relevant to the area is allowed to emerge. It holds the tenet that qualitative researchers do not go about testing hypotheses to add to an already existing body of knowledge but rather…" (Babbie and Mouton, 2001, pp.498-499).

useful and fitting with my current research and evaluation. Thematic analysis can be used in various frameworks, but in this research, I will acknowledge the ways teachers make meaning of their experiences of the PDP and in turn the ways the broader PD programme's context affects the take-up, implementation and conceptualization of this specific PD programme, and how the whole process impinges on those meanings, while retaining the focus, the material and other surfaces of reality.

### 3.8.1   What Will Count As A Theme In This Research?

This Research will follow Braun and Clarke's (2006) outline of systematic thematic analysis: They contend that what counts as a theme, captures something important about the data in relation to the research question and represents some level of patterned response or meaning within data set. The question on the size of the theme depends on the researcher and the data at hand. Themes selection will be guided by how the emerging theme captures something significant in relation to the three research questions that control this research. Prevalence or quantity or frequency of a theme will not be used to capitalize or classify a theme as important or not because this research is basically a qualitative one.

Secondly, the researcher will provide more detailed and nuanced account of the one particular theme or group of themes, within the data. This will be embedded in the main research question. I employed the theoretical thematic analysis against the inductive approach. Reason being that data cannot free themselves of their theoretical and epistemological commitments and data are not coded in an epistemological vacuum. Moreover, my research is driven by specific questions; these questions are predetermined before collection of data, whilst in inductive analysis the questions evolve as data is coded (Braun and Clerk, 2006, p.84). In this analysis less description of data was made, however, a more detailed analysis of some aspect of the data will be made.

I decided to use thematic analysis at the interpretive level; that goes beyond the semantic content of the data, and starts to identify or examine the underlying ideas, assumptions and conceptualizations and ideologies that are theorized as shaping or informing the semantic content of data (84). The analysis that will be produced by this research will be interpretative work not just descriptions but is already theorized.

Research epistemology guides what I say about data and informs how I theorize meaning. Constructionist[5] epistemology has informed this research as I believe that meaning and experience are socially produced and reproduced, rather than inhering within individuals (p. 85). Thus I theorize the socio-cultural contexts and structural conditions that enable individual accounts that are provided in this research.

### 3.8.2   Braun and Clarke's 6 Step By Step – Thematic Analysis

This research information guides me when I look into the data. These steps guided me through the data that was collected and how it was analysed.

- Familiarizing myself with my data
- Generating initial codes
- Searching for themes
- Reviewing themes
- Defining and naming themes
- Producing the report.

Since this research involves various stakeholders the circles below will be used to direct systematic analysis. I will begin by looking at the biographical data of all the respondents presented in a tabular form with an analysis that follows it. I will then look at the data as transcribed from the PD providers, the teachers and then the Department of Education Officials. The selection of themes was informed by my thinking through the literature links that I went through, while themes were also allowed to purely emerge from the data. In critique to 'emerging themes', Braun and Clarke say that; 'themes emerging' can be misinterpreted to mean that themes 'reside' in the data, and if we just look hard enough they will 'emerge' like Venus on the half shell(2006). [Goes further] If themes 'reside' anywhere, they reside in our heads from our thinking about our data and creating links as we understand them (2006, p.80). Moreover, they acknowledge that our own theoretical position and values are important in qualitative research as they aid our research process.

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[5] Owen and Rogers expand that, constructivist paradigm is based on a belief that reality or at least social reality, is socially constructed- that is there is no objective reality. The aim is not to find the 'right' description of a programme, but to develop an increasingly sophisticated description that incorporates the perspectives of all concerned. An evaluation based on this paradigm would focus on gathering construction, descriptions and analyses from relevant people, including intended clients, staff and others jointly reflecting on them and seeking synthesis and consensus (1999).

The diagrams below are brief explanations of the paths of analysis which I will use in the analysis.
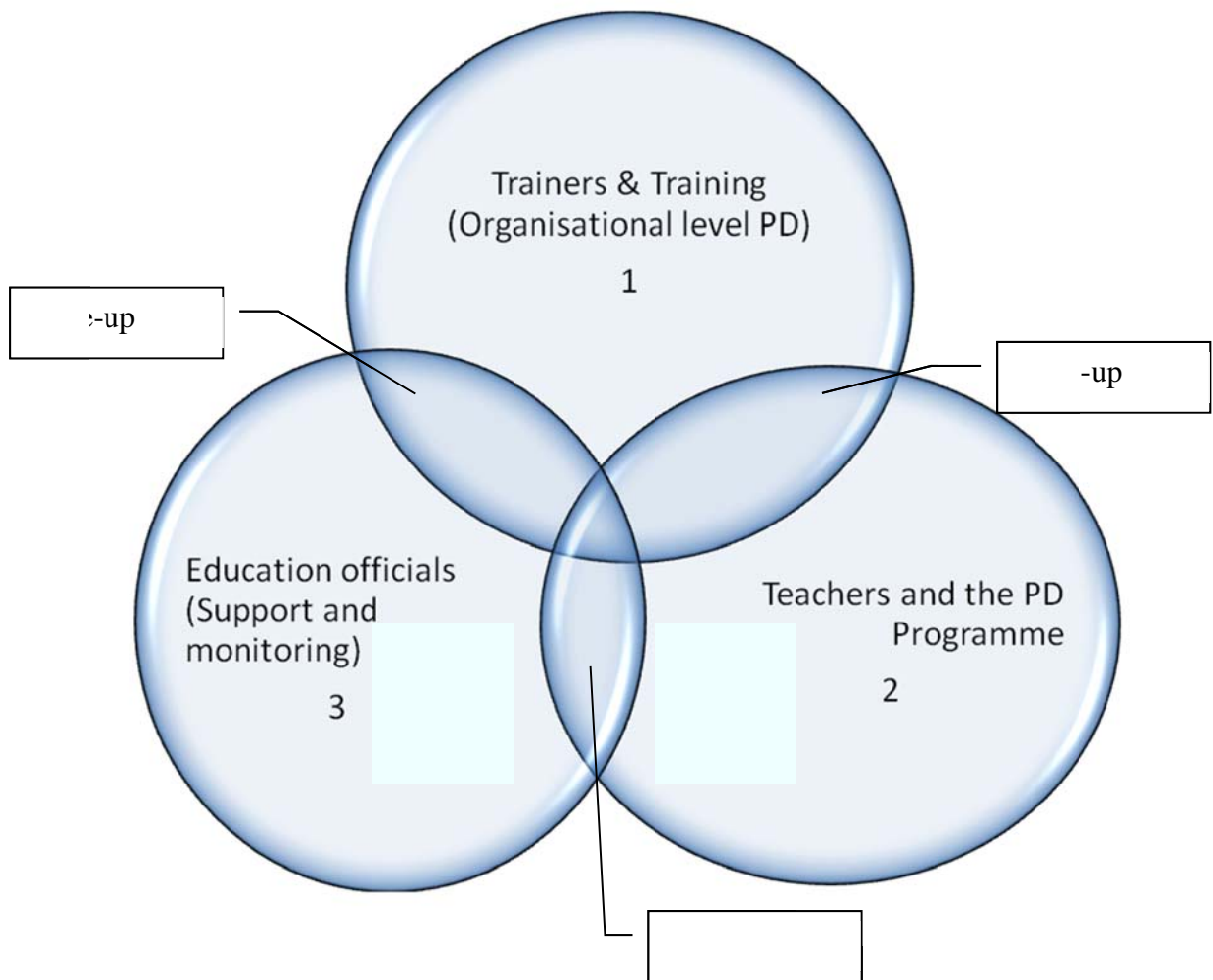


Diagram 3.3: Stakeholders in the PDP- guidelines to data analysis and interpretation.

1

- Background of the PDP officials
- The conceptualization of the PD.
- The training content and curriculum process (including link to RNCS).
- How the real workshop is conducted.
- Did the teachers' participating acquire intended skills and knowledge to carry out environmental education as life science teachers? How did you determine this?
- What are some of the challenges you face as trainers in this PD programme?
- Did the teachers apply the new knowledge and skills in their practice?
- Are participants' attendances improving?
- Are there dropouts? Any established reasons?

2

- Background of the teachers.
- How they came to the PDP.
- What they have learned at PDP?
- How are they putting this into practice?
- Are the teachers more confident as teachers in EE from this training?
- Do they get further support in implementation of what they have learned? How?
- What would they like to see done differently in order to improve their development for the future.
- What are you still struggling with in regard to implementation?
- Was implementation advocated, facilitated and supported?
- Were sufficient resources made available?

3

- Background of the Education Department Officials with regard to EE.
- Their roles with regard to EE and life sciences integration.
- How involved they are as far as PDP is concerned?
- What criteria do they use to select teachers into the PD programme
- What support and follow up do they give to ensure take-up and implementation of the PD programme at this specific PDP
- Do they think PDP's intervention is necessary? Have they been through the training?

- What roles do you think need to be improved in order to expand the sustainability of the Programme?

- What suggestions will you render in order to improve the liaison between, teachers in the PD programme and PDP as an intervention?

  (Ideas on the levels of professional development evaluation are adapted from (Guskey, : 2002, p.48).

These are guidelines that will inform the analysis of data in chapter four, otherwise the themes will be allowed to emerge from the data itself.

The programme analysis logic: who sets the standards?

In this section, the researcher needs to display the understanding that data analysis, especially in evaluation research, did not emerge from a vacuum but was informed partly by the following knowledge on evaluation research. Thus the following ideologies and epistemologies informed my data analysis process as described in the next paragraph.

Many evaluation scholars struggle with the fact as to whether a programme evaluation should have some sort of standard to make a better judgement of the evaluation outcomes, which Craft1996) identifies as evaluation indicators. These ideas sounds right when I read their explanations of either program logic, logic of evaluation or evaluation indicators or evaluation standards(Owen et al., 1996, p.5; Craft, 1996, p.61). Even as I did ask crucial questions on who is to set standards, as an evaluator of an already existing programme, who sets the values of a programme? I am left to ask a lot of questions in judging the worth of a programme. If I am to work on programme improvement, then I agree with Rossi, when he says that programme objectives and intended outcomes actually seems to set standards in itself in which a programme evaluation can begin to work. In this programme, the conceptualization of the programme aided the way in which this it was evaluated.

### 3.8.3    Integrating Rossi's Concepts for Evaluation:

Rossi et al. (2004) asserts that program process monitoring is the systematic continual documentation of key aspects of program performance that assesses whether the program is operating as intended or according to appropriate standard. The data analysis was informed by Rossi's theoretical understandings of evaluation research which the researcher found useful as Ideologies that informed the analysis itself after the data was coded. Data analysis was embedded in epistemological exposition as supplemented by Rossi's position as discussed below. Moreover, in the evaluation, the following was integrated in order to monitor organizational functions:

#### 3.8.3.1    Service Delivery:

Many programmes fail to show an impact because of the failure to deliver interventions specified in the programme design, this Rossi calls "implementation failure" (Rossi et al., 2004, p.191). He identifies three kinds of this failure as follows: "no intervention or not enough is delivered; the wrong intervention delivered and the intervention is unstandardized or uncontrolled and varies excessively a cross the target population".

#### 3.8.3.2    The Delivery system:

The programme delivery system is a combination of pathways and actions undertaken to provide an intervention. It consists of a number of separated functions and relationships. These relationships can clearly be indicated by the three circles above. One way to determine take-up of the program implementation is as shown in the figure above. The relationships and the various roles as depicted above. Specification of services and accessibility formed part of this assessment. This has been clearly indicated in the above diagram 3.3. Rossi et al. indicate that in programme delivery accessibility is vital because it enables the evaluator to assess the extent to which the structural and organizational arrangements of PD a programme facilitate participation in the program and specification of services (2004).

#### 3.8.3.3    Programme Support functions

According to Rossi et al. indications are that providing intended services is presumed to be a programme's main function, and one essential to monitor (2004, p.196). Most programs also perform certain important support functions, which are critical to the programme's ability to maintain itself and continue to provide service in itself.  In this evaluation, the PD programme support functions will be evaluated to see the extent in which the programme support

functions help to contribute to take-up; implementation processes and how this support functions help in improving professional development of teachers.

### 3.8.3.4 Description of the program operation

Assessing the extent to which a program as implemented, resembles the programme as designed, depends on having a full and accurate description of how the programme actually operates. This covered a range of topics as estimates of coverage and bias in participation: the types of services delivered the intensity of services given to participants of significant kinds, and the reactions of participants to the services delivered. This was encapsulated using descriptive and narrative accounts as gathered from the data (Rossi et al., 2004). In the analysis and interpretation of the programme, I will evaluate the programme based on the description of programme operation (Rossi et al., 2004) as sourced from the respondents. This Description will give information on programme theory and entire operation of the programme.

### 3.8.3.5 Comparison between Sites

When a programme includes more than one site, a second question concerns differences in programme implementation between the sites. Comparison of sites permits an understanding of the sources of diversity in program implementation and ultimately outcomes such as differences in staff, administration, targets, or surrounding environments and it also can facilitate efforts to achieve standardization. The spaces in which this PD programmes are conducted and implemented are crucial. I will gather information with regards to the various sites of training and sites of implementation as these aspects also influences the nature of take-up and the implementation of the PD programme.

### 3.8.3.6 Conformity of the program to Its Design

The degree in which the PD runs as compared to its initial design is an essential element for assessment that this research paid attention to. Monitoring service utilization will be integrated. Rossi et al indicates that critical issues in program process monitoring are ascertaining the extent to which the intended targets actually receive program services. Target participation concerns both program managers and sponsors. Managing a project effectively requires that target participation be kept at an acceptable level and corrective action be taken if it falls below that level (Rossi et al, 2004, p.183).

The question here is who determines the acceptable level at this stage? As I looked into the data analysis this question was a crucial one that informed my lenses of analysis.

*Coverage and Bias*: service utilizations issues typically break down into questions about coverage and bias. Coverage is the extent to which participation by the target population achieves the levels specified in the program design; bias is the degree to which some subgroups participate in greater proportions than others. A programme that reaches all projected participants and no others is obviously not biased in its coverage. But because few social programs ever achieve total coverage, bias is typically an issue. This information formed part of the evaluation as data was analysed and interpreted.

In assessing Bias in programme participation examining the differences between individuals who participate in a programme and either those who leave or those who are eligible but do not participate at all. Rossi et al ascertain that drop out or those who are eligible but do not participate at all. In part dropout rates or attrition, of a project may be an indicator of clients' dissatisfaction with the intervention activities. It may also be an indicator of the condition in the community that militate against full participation. Such data might be collected from the attendance register or participation of the researchers in the research itself (Rossi et al., 2004).

### 3.9 Data discussion and interpretation

Data interpretation and discussion was made with regard to the data collected and the analysis made from the data. Conclusions were also drawn based on the research findings.

### 3.10 Summary

In this chapter I have discussed in depth the epistemological and ontological perspectives that explain the path of this research study. I have described interpretive formative evaluation as a design used in this research. I have highlighted my research methods, sources of data and data collection methods that will help in the understanding of the Professional Development Programme from the stakeholder perspective, which in turn will provide data for evaluation of the programme. I have also attempted to describe the path of thematic analysis as a framework for data analysis that I will use in the data presentation and analysis in chapter 4. In the next chapter I present and analyse data.

# Chapter 4
# Data Presentation and Data Analysis

## 4.1  Introduction

This research is guided by the following fundamental questions that inform the writing of every single chapter in this research. The questions will inform the analysis at this level (at the analysis stage). The data analysed is guided by this main research question and sub questions.

Main question:

- *How has teachers' training in Environmental Education enabled professional development of teachers in EE?*

Sub questions:

- To what extent has the Professional Development process at the South African National Institute of Biodiversity enabled implementation?
- How effective has the Professional development Programme been in regard to the take-up?

Most of the procedures and theoretical framework for data analysis in this research have been explained in detail in chapter three. In this chapter I will go straight into data analysis. For emphasis the data analysis will follow the procedures below.

**Step 1: Familiarizing Myself With My Data:**

At this level I immersed myself in data through continuous reading of transcribed data and listening to the audiotapes that I recorded. Repeated reading of data and taking notes enabled me to search for meaning, patterns that helped me to familiarize myself with the data (see table 4.1).

**Step 2: Generating Initial Codes**

In generating initial codes I changed my transcription into a tabular form where I searched for codes from the various data sets which were recorded in the second column of the data as shown below (See table 4.1). The codes reflected the phenomenon that is indicated in the research questions. This process was partially informed by the indicators of the formative evaluation process as explained in Chapter 3 and was also allowed to emerge from the data

itself. During this analysis I followed the emphasis laid by Clarke and Braun (2006) that in coding the overall conceptualization of data patterns and relationships between them does not have to smooth out or ignore the tensions and inconsistencies with and across data items. I also retained the accounts that were departing from the dominant story of the programme evaluation analysis (Braun and Clarke, 2006, p.89).

**Step 3: Searching For Themes**

I began to search for themes after recording all codes. I then sorted all the codes into potential themes, which I have, indicated in the second column of table 4.1 and illustrated through visual diagrams in the analysis, which Braun and Clarke indicate that such a format will be more presentable if put in visual forms (2006, p.89). Further to this I used a tabular form to sort my themes which can be found in appendix 7.

**Step 4: Reviewing Themes**

I began to review themes after searching for candidate themes that were presented in the table 4.1. At this stage I started to look for internal homogeneity and external heterogeneity of the themes searched which brought about coherence sequencing and flow of the themes as presented in appendix 7 (Braun and Clerk, 2006, p.91).

**Step 5: Defining and Naming Themes and Producing the Report.**

At this point I defined and refined themes by identifying the essence what the themes are about and the meanings they gave to my research (Braun and Clarke, 2006, p.92). These are first presented in visual forms from diagram 4.1 to 4.12. After this follows coherent and internally consistent accounts with accompanying narrative of themes and how they emerged from the data. When doing this, I was able to identify the interest about each of them and data set and why they were of interest especially with regards to the main research questions. Therefore in each theme I have given a detailed analysis that is coupled with reflections of how they fit into my programme evaluation and its objective for improvement and sustainability of the PD programme.

The data has been explained in three levels as I have mentioned in chapter three. I have looked at the *PD programme official* data, *the teachers* and the *Educational Department officials* as they form part of the stakeholders of this PD programme that I evaluated. The data analysis will go through the above steps as adapted from Clarke and Braun (2006).

Tables 4.1 illustrates the process I followed to develop themes from the data. I also combined the themes for the three stakeholders in the process. The diagram (in appendix 7) represents a tabular view of the main themes that emerged from my process of data analysis for each of the stakeholder.

The first column presents a partial focus group interview transcript from the PDP officials. From repeated reading of the transcript, I generated the first level of coding in the second column as illustrated below, and then further down to identifiable themes in the third column. The third column themes then were clustered based on the relationships that emerged which then is clustered in table in the table in appendix 7. This excerpt is a partial presentation of one of the transcripts that I engaged with in theme coding. It is an illustration of the processes that I engaged in during theme identification and selection. Due to the voluminous transcription, I present partial explanation of the processes (see data analysis as explained earlier and in chapter 3) and an additional selected transcript coding in Appendix 5.

Table 4.1: Data coding and identification of themes from a transcript.

| Focus group discussion-partial transcript-organisational perspective: | First level of coding | Coding and identification of themes |
|---|---|---|
| What informed the curriculum process and conceptualisation of this PD programme?<br><br>R1:      Since about 2005 we've been doing teacher professional development programme and the process that we followed was the teachers would come for workshops, we would build their knowledge and to a certain extent their skills. | Initial program aims and objectives in building knowledge in skills of teachers.<br><br>Program Progression<br><br>Format of activity through workshops | Programme history/evolution<br><br>Process monitoring from management perspective |
| They could then use the curriculum documents to create a lesson or an activity.  What we tried to do was to get them to link what they've learned to the local context back at school. In the Western Cape we have a | Teachers' workload especially the administration aspects have proven to be the barrier to implementing the PD. | Programme initial aims and intentions |

| | | |
|---|---|---|
| very unique scenario of various different kinds of vegetation types. | Took school contexts in to consideration in their planning | |
| | Used Curriculum documents to plan activities. | |
| Yes, we have Fynbos, but not all the Fynbos is the same. If we were to base everything on the kind of mountain Fynbos we have here, it wouldn't relate to what the learners see back in their own school context. | | |
| | Resources at training are not the same as what teachers would use in their schools. | |
| When we ask teachers to come back and report what they have done we found there was a gap that very, very few of them were able to go back to school and implement, that they either caught up in the admin of their work, or the work load, that they didn't take it down in to their work, in to their Curriculum and in to the learners' work. | | Barrier to implementation |
| | The impact of the professional development of teachers was not as effective as the PD providers expected. | |
| | | Impact evaluation management perspective |
| Therefore we found that the impact of that Teacher Professional Development Process wasn't as great as we expected. When we received potential funding for a new project. | The funding for the project was available. | Intended outcomes verses actual outcome. |
| | | Project funding |
| [...] we were very keen to work on the FET, by then I had gotten to know that there was this thing called Active Learning Framework; | Has an intention that the PD they do with the FET teachers was to be reflected in the learners' portfolios. | Intended outcomes |
| And when Donavan said to us: Once you got money, what kind of project would you like to do? I said to him definitely FET and definitely where teachers have to get to the point where their project that they do, goes in to the learners' portfolios. | There was a compulsory action project that every teacher was expected to do as part of the actual programme. | |

| | | |
|---|---|---|
| Actually there is an action orientated project that they have to do as part of the actual programme – not as something that they can maybe do. | Developed a partnership with an organisation (Harambee)as funders and the Western cape Education Department with Curriculum Advisors as significant partners | Partnership |
| That is why we set up the project in such a way that it was a partnership. Yes, an organisation (Harambee) is a partner but they are the funders. For us a significant partnership was with the Western Cape Education Department, with the Curriculum Advisors. What we hoped to achieve that was we (Unclear) the knowledge building part and the skills building part. We see that as our strength. We hoped that the Curriculum Advisors would then come in as partners and continue the process back at school with the taking it in to the curriculum and putting it in to actual learners work and learners' portfolios which would then be assessed by the teachers for marks et cetera; | Goals and aims of the programme were to:<br><br>1. Provide the knowledge building aspect and the skills building which they saw as their strengths.<br><br>2. And hoped that the Department of Education officials would then come in as partners to continue the process back at schools with taking it into the curriculum and putting it into the actual learners portfolios which will then be assessed by teachers | Conceptualization of programme aims, objectives and goals<br><br>Roles played by Department of Education officials |
| …] The Curriculum Advisors would continue to support the teachers in to an action project. That was our thinking that has to lead to action taking in a local context. | 3. They also intended that the Department of Education officials would support the teachers into the action projects. | |
| Most environmental education studies nowadays saying that we need to move beyond just awareness. Learners actually changing lifestyles, adults need to change lifestyles and they need to actually say as a citizen of South Africa, what is my role in changing what is happening, things that I see, environmental | This is what informed their thinking at that point. | Epistemology , ontology and ideology that informed the programme |

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| issues risks concerned that I see in my communities. The other outcome of this project was that we were trying to create a group of lead teachers. The concept was built around that concept. We had asked the curriculum advisors to identify. | | |
|---|---|---|

**Step 6: Defining; Naming and Reviewing of Themes:**

At this stage analysis in reviewing themes defining and naming themes that emerged follows:

### 4.1.1   The Organisational Level: The PD Programme

In this section I will analyse the interviews as transcribed from the perspectives of the developers and trainers in this PD programme. Several questions were asked to determine the conceptualization and understanding of how this programme is planned, circulated and executed.  It also includes the results of the training process. Not only will data be generated from the semi-structured interviews and focus group discussions but data will also be generated from literature in respect of evaluation research and the relationship with regard to organisational evaluation of a PD programme as generated by this research.

The foremost results this research aims to find at this point are: Background of the trainers; the conceptualization of the PD; the training content PLUS curriculum process (including link to RNCS); how the real workshop is conducted; whether the teachers participating acquired the intended skills and knowledge to carry out environmental education as life science teachers; how this was determined; challenges faced by trainers in this PD programme; how the teachers apply the new knowledge and skills in their practice;  and the attendance  of the PDP session.

A partial interview excerpt has been presented in table 4.1 above and visual presentation of themes has also been displayed. All these is augmented with the descriptions below to illustrate the process that was followed in regards to generating initial codes, searching for themes, data coding and generation of themes at this level and the description of themes that emerged to analyse them.

### 4.1.1.1 Historical background of the programme:

In this theme I will analyse the data that emerges as historical explanation of the programme. The historical understanding of the programme will enable the researcher to follow through to the current understanding of the programme, which is also a theme that is emerging. This theme will then be looked at under the sub-headings that follow which also emerge from the focus group discussions, semi-structured interviews and document analysis. Diagram 4.1 below illustrates this theme in a visual format.
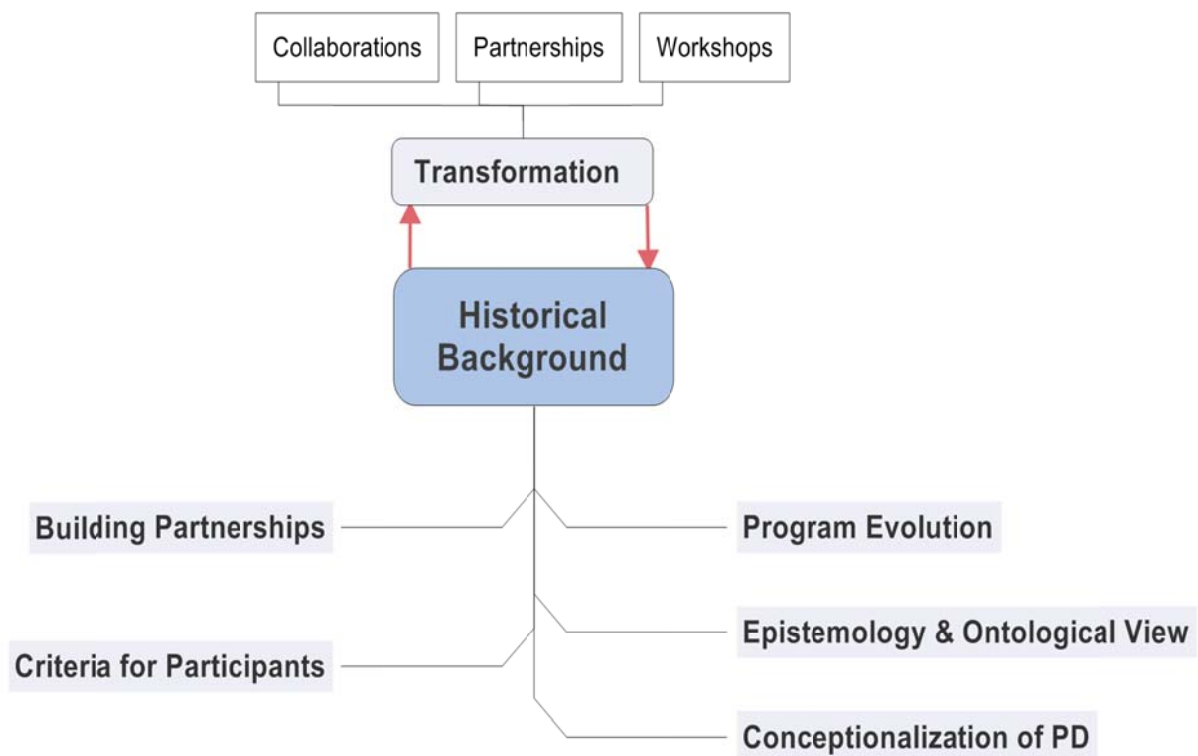
Diagram 4.1: Historical Background and Transformation

Programme evolution (process)

In programme evolution, I will analyse the data as described by the respondents and PDP documents regarding the gradual and dynamic changes that has taken place over time from inception in order to understand the current status of the programme. It will also put in focus the conceptualisation of the programme objectives, aims and goals from initial stages, funding and the implementation process will also be discussed to understand the current position of the programme.

The PDP is described to have started in the year 2005, as a teacher development programme.

> Since about 2005 we've been doing teacher Professional Development Programme and the process that we followed was the teachers would come for workshops, we would build their knowledge and to a certain extent their skills. They could then use the curriculum documents to create a lesson or an activity. What we tried to do was to get them to link what they've learned to the local context back at school… (Achieng: pg1: focused group interviews)

The reason why the PDP officials wanted the teachers to link what they learned at school was because the context of the training was not similar to that of the school environments where the teachers came from.

> In the Western Cape we have a very unique scenario of various different kinds of vegetation types. Yes we have Fynbos, but not all the Fynbos is the same. If we were to base everything on the kind of mountain Fynbos we have here, it wouldn't relate to what the learners see back in their own school context. When we ask teacher to come back and report what they have done we found there was a gap that very, very few of them were able to go back to school and implement, that they either caught up in the admin of their work […](Achieng: pg1: FGI)

This indicates that the PDP officials continually assessed the ways in which they carried their professional development programme in order to improve it. Apart from the above problems PDP officials experienced difficulties in implementing the programme they had planned to do. Teachers' workload at the school especially the administration aspect has proven to be the barrier to implementing what the teachers had taken up.

> […] workload, that they didn't take it down into their work, in to their curriculum and into the learner' work. Therefore we found that the impact of that Teacher professional Development process wasn't as great as we expected (Achieng: pg2: FGI).

The composition of schools consisted of 10 High schools predominantly from low socio economic areas (names reserved). Grade 10, 11, and 12 learners were to form part of over a period of three years as they progress from Grade 10 upwards. Life science Head of Departments and further grade 10 educators who showed willingness to start the project with grade 10 learners and then proceed with the same group of learners to grade 12 were envisioned to form part of this PDP (partnership review document, obtained with permission).

### 4.1.1.2    Conceptualization of the programme objectives, aims and goals:

In one of the documents entitled "partnership Review, Biodiversity, Sustainable Development and climate change within the FET" obtained from the PDP officials with a written permission letter, describes the background of the programme, the purpose and aim of what the programme intended to achieve.

This programme became a need in time when the National Curriculum Statement became clear that there was a need to support the professional development of teachers and to resource the curriculum. This programme was managed by Gold Fields Environmental Education Centre for over 14 years and implemented many programmes for learners and teachers' professional development. So this PDP (FET-Biodiversity, Life Sciences) took learning of previous programmes which they drew from the Gold fields Environmental Education Centre into account to ensure that maximum benefits are achieved. They add that careful thought was given to the aspects such as collaboration between partners, selection of schools, number of participants and topics. More specifically it envisaged a sustained, systemic approach through a process of working with an initial group of educators.

The main aims and objectives of the programme are stated in the documents the researcher obtained with the permission of a written letter from the organisation. They aim to:

> develop global environmental educators through a capacity building pilot programme with a cluster of Life Sciences educators within the Further Education and Training (FET) band from 10 schools from two Education Management District Centres…(Proposal to Harambee, October 2007).

At the initial stages and planning of this programme, the PD intended to provide knowledge building aspect and the skills building which they saw as their strengths. The purpose and aims of this PDP as documented in this review are as follows:

- To build educators' content knowledge.
- To develop global environmental educators through capacity building pilot programme which focuses on teacher professional development
- To expose educators to active, learner-centred approaches
- To assist educators in developing their own lessons on the topic and to provide learners with an opportunity to actively participate in action projects. (Partnership review document: obtained with permission from PDP officials)

They also hoped that the curriculum advisors would then come in as partners to continue the process back at school by taking it into the curriculum and putting it into the actual learners' portfolios which will be assessed by the teachers. They also intended that the curriculum advisors would support the teachers in the action Projects.

> What we hoped to achieve that was we (Unclear) the knowledge building part and the skills building part. We see that as our strength. We hoped that the curriculum advisors would then come in as partners and continue the process back at school with the taking it in to the curriculum and putting it in to actual

learners work and learners' portfolios which would then be assessed by the teachers for marks et cetera. And also that the curriculum advisors would continue to support the teachers into an action project. (Achieng: FGI-management perspective).

### 4.1.1.3    Building of partnership:

In order to realise their dreams, this programme identified a partnership that they considered as very essential. They received funding from an organisation (Harambee) to whom they presented the programme proposal that in the end made this programme possible. They also realised that collaborating with the Curriculum Advisors from the Department of Education would strengthen their relationship and ensure that the programme is taken into the schools and into the learners' portfolios. Thus the Curriculum Advisors were to become their support team in the selection of teachers during the implementation stage of the programme into the schools.

> And that is why we set up the project in such a way that it was a partnership. Yes, an organisation [Harambee] is a partner but they are the funders. For us a significant partnership was with the Western Cape Education Department, with the Curriculum Advisors (Achieng: FGI: pg 2-3)

The roles of the curriculum advisors were recorded to be: selection of schools, liaison role, and formulation of cluster groups, monitoring and evaluation and sustainability and co-instruction of the programme. Out of the three advisors, one of them was concerned with strengthening e-Learning (Partnership review document, with permission from the PDP officials). The e-Learning aspect did not take place. Other partners included Harambee,[6] which was more in funding and providing input into the structure of the programme. The PDP officials had the responsibilities of Management and facilitation of the project and institutional support, and University of Stellenbosch was to provide academic rigor to action research process (partnership review document from the PDP[7], by permission).

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[6] Pseudo name

[7] This document was given to me by the PDP officials and the content are not displayed for ethical reasons. Rights of privacy are reserved; hence the referencing appears as it is.

#### 4.1.1.4    Epistemology, ideologies and ontological views that informed the programme:

This describes the knowledge, realities and ideas that informed the necessity of this specific programme and the circulation of the programme aims and objectives. It also includes all the processes that lead to the design of this programme. For instance the reality of change in curriculum during the inception of this programme informed and necessitated the need for an intervention like this one. It also includes some motivating factors that led to the starting of this programme.

Betty explains,

> […] I think just one thing, just backtracking even further was that the dramatic change there was to the school curriculum and many of our teachers were trained under the old system of rote learning and everything was in the text book. And Learning Outcome which appears in your Natural Sciences, Natural Science, Social Science etc. which is linking science, society and the environment which is a call to skills, not just knowledge. Those were new concepts in the new curriculum and particularly when this FET programme was implemented that was the time at which the new curriculum was phasing in to the FET curriculum. (Page 5 of Transcription – FGI- Management perspective)

The Ontology of the teachers status and socio economic situations that informed the intervention of this programme are described by Betty,

> […]I think where the whole need for this has come in. It applied across the board but particularly in the education sections from the old systems where in fact, perhaps the training was really not design towards skills as well as... And where educators often, because of the socio-economic conditions of their schools, had never been exposed to field trips and that type of thing which would lead in to the new way of doing things. Therefore we found that the application of that type of thing was very difficult for educators who themselves, neither in schools, nor in their training, have ever been exposed to it... (R2 page 6 focus group interview).

In the same vein ideologies and realities that also informed the programme is expounded by Achieng

> ….Most environmental education studies nowadays saying that we need to move beyond just awareness. Learners actually changing lifestyles, adults need to change lifestyles and they need to actually say as a citizen of South Africa, what is my role in changing what is happening, things that I see, environmental issues risks concerned that I see in my communities. The other outcome of this project was that we were trying to create a group of lead teachers. The concept was built around that concept …. (R1: page 3 FGI).

### 4.1.1.5    Criteria of participants/targets of the programme requirements:

From the management perspective, they had asked the department of education officials to identify Life Science teachers who had shown ability in life sciences potential to become lead teachers, because they had intended to build this group of teachers to a point where they could also take lead to assist another group, what they call "waterfall effect".

> We had asked the department of education officials to identify the teachers simply because we were looking for teachers who had shown ability in Life Sciences potential to become lead teachers.  What we were trying to do was to build this group of teachers up to a certain point where they could then assist another group of teachers to bring them up to the same point and so you would have this waterfall effect as they share their knowledge and skills et cetera. Yes, I think that was the intention of the project (Betty, FGI).

On the other hand, in the partnership review document, selection criteria is described to have been done on the basis of previous interest shown in environmental initiatives. Life Sciences Curriculum Advisors from the concerned districts had a pivotal role in the selection process and participation was voluntary (partnership review document, obtained with permission from the PDP).

### 4.1.1.6    Transformation that took place from the programme inception:

In this theme, the data explains the changes that took place as positive outcomes, and determinants that help aim the modelling of this programme. During the Audit stage, of the programme the respondents indicate that this process aided them to determine teacher's need to use curriculum documents. This had a positive impact in that,  teachers would then be able to learn how to use the curriculum documents and identify the integration of Environmental Education more clearly in Life Science and in their other learning areas that they teach which became more practical and relevant to teachers work. This then is considered to have been an eye opener. This also indicates teachers' take-up from the management perspective.

In the process of implementing the workshops they exposed the teachers to the curriculum documents and they did not know how to use the documentation.  Through this exposure the PD diagnosed the need for training teachers to use the curriculum documents. This is a positive realisation of need towards this intervention. This PD opened teachers' eyes to the use of curriculum documents. Achieng explains

> I remember when we started our first batches of workshops and exposed the teachers to the curriculum documents statements they were lost; it was as if they'd never use this documents in their entire life. We've seen that grown now, so that now when we give them documents, they go o yes, o yes, o yes (FGI: page 6.)

The implementation of this programme had positive impacts as it was able to deliver a three hour programme driven absolutely by the curriculum. Teachers displayed signs of not having used the curriculum documents in the past and this was an eye opener. Teachers were also, according to the trainers and managers, able to see the applicability of this training in their new awareness of the curriculum across the learning areas and developed comfort levels. This continuous back and forth reflective activity from their experiences has helped them learn and identify the needs of this programme. This is a reflective practice that has been away for the PD programme to monitor its activities and objectives. Explained by Betty in the extract below:

> 2005, 2006 we would deliver a 3 hour programme absolutely derived from the curriculum. You might get educators making comment like: It would be nice if this link to the curriculum. And we looked at this comment and think good grieve! Where now almost every programme that goes out in that block, the educator is able to say: I can apply this in my Life Orientation, Natural science, and actually list the actual outcome that they are going to actually use this outing towards. So I think there's been a general increase in the teachers' comfort level with the new curriculum (FGI: 7)

This was a success for the PDP officials because they were able to assess teachers on work with regard to use of curriculum document. This became a reality when they had to draw out of their PDP training sessions to include curriculum processing as part of their planning of the workshops. This also impeded in their planning for future PDP; which was something that teachers needed. This ideology was very phenomenal because teachers would then be able to relate what they learned at the PDP to their working contexts at schools.

### 4.1.1.7 Form of activity: training was through workshops:

The workshops was an Idea that was developed through a research project that Achieng did, it was part of a short course on Environmental Education in a named University

> In 2005, I was doing my …at a University. It's a basic EE course that they run. And I needed to create a lesson and my lesson that I chose, there was a need to restart the Future Development Process at the centre. Previous staff member had resigned. And I chose to do a workshop. And at that point, obviously, in the process of becoming... (Achieng: Pg8: FGI)

In order to determine the contents of training in the workshops the PD carried out an Audit, explains Betty,

> [… ] Did first was to create an audit. So the idea of the audit was every teacher who was going on the professional development sessions, completed this audit. It clearly gave us an idea, through very clever questioning of what they understood by the key terms bio diversity, environment, sustainability... As well as asking them about what resources they knew of, or which were available at their schools. In fact, what Achieng did in the workshops came from that. You had some stunning percentage like 87% or something of the teachers who were at that time teaching the curriculum that include word like bio diversity and sustainability did not understand in drawing in anything. They could not explain the terms (Betty, pg8: FGI)

The workshops contents also grew to include topics like climate change, Active learning Framework for the FET programme and much more. Achieng says, "I think over the years we've re introduced new things like climate change. For the FET programme we need to do the active learning framework" (FGI: pg 8).

An important aspect of this PDP is that one of the programme officials also had to improve herself through training in a short course at a university based programme. This is essential, because for one to be able to empower others, he or she needs some form of empowerment as well. I think this had an impact to the contents of the workshops as well, as the contents also improved from the initial ones they had. Achieng explains, "Then through the University course... and I think over the years we've re introduced new things like climate change. For the FET programme we need to do the active learning framework..." (FGI: 8).

They also have encouraged participants to evaluate their methods of delivery in the process in order to assess effectiveness of their facilitation. They informally assumed that they evaluated the programme by what worked and what did not work. They did not generate any formal way of evaluating the programme, and this affected the way take-up was assumed.

Resources they used in the workshops included: projectors, power points that were used to project contents of the lectures that they had as well. They also used games and group activities that involved working with curriculum documents. Teachers also drew a range of pictures on white boards including the concept of environment and picture-building activity. These activities were meant to be exemplary activities that teachers would in turn use in their various classrooms. Opportunities were also created for teachers to create own activities to practice knowledge obtained through the workshops. They contextualised their workshop contents to suit the context of the participants (teachers).

> And you also respond to the group. Although with those workshops we had a fixed what we did every time. You don't say exactly the same words or whatever. We're not that stuck. We have seen that; we have different groups come in and maybe do that same set of overhead. We to contextualise a set workshop (Betty: FGI: pg10)

And Achieng adds:

> I'm thinking of the one that we did in the Eastern Cape. Same workshops are done with community members who were actually working in the gardens there. It completely changed the kind of way, the words which you used... I suppose it comes from our ability as teachers (Achieng: FGI: pg10).

This also is an indicator that this programme does not only run for the teachers in the Western Cape but that it is also expanded to other provinces as well. Their professional background as teachers has enabled them to adapt to different contexts. This also reveals that these same workshops are run not only within the regions that I am looking at but that they are also expanded. This is an indicator of the parameters that are covered by this programme.

### 4.1.1.8    Workshop design:

In the workshop designs, the researcher intends to look at those things that determined their workshop objectives, aims, goals and the contents of the workshop topics and how they derived the activities and the whole plan of how they went about formulating the workshops to what they are at present Diagram 4.2
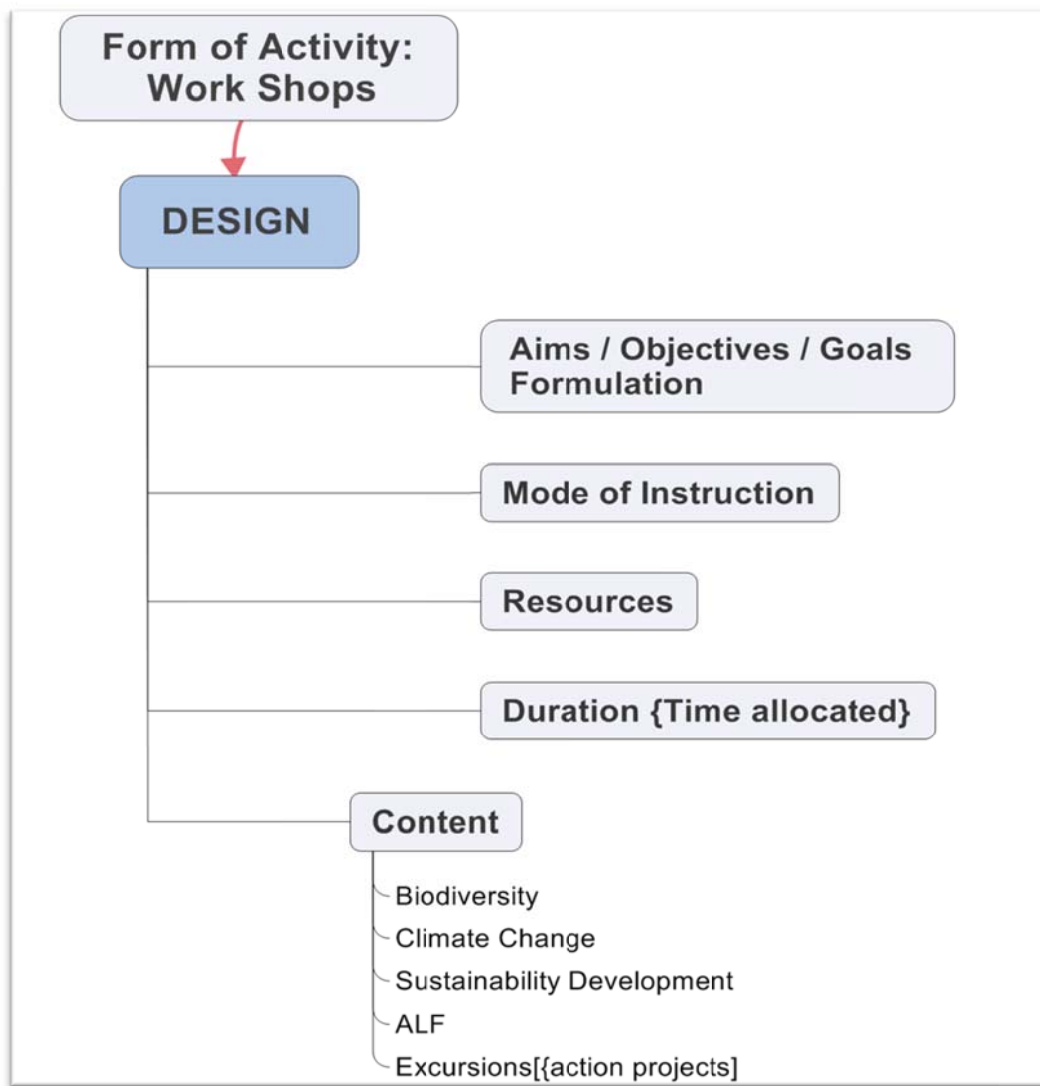
Diagram 4.2: Form of Activity - Workshop

The respondents explained that for them to come up with the workshop contents they looked at their organisational overarching goal and an institute of biodiversity. This they said determined and formed an integral part of their contents, activities and resources amongst others. They also looked at what the teachers work entails. Explains Achieng

> I suppose determining that it is the aims that we want to achieve, our particular needs as an organisation (speak unclear) and one of these objectives is to simulate information about bio diversity climate change, sustainability development issues. That's on the one side. Then we normally take that can say how this fitting into what teachers must do is. ... So that we are actually getting our messages across but at the same time assisting the teachers in what they need to do within the curriculum. It's not like we've done it (unclear) through teachers. We have done it through Curriculum Advisors (FGI: 11).

Betty expands further to say that their background as experienced qualified teachers also gave them advantage and credibility in dealing with teachers and were able to fit in the shoes of

possible activities that would fit teachers without being unrealistic. This also augmented in formulating of workshop contents as their biodiversity background was an added advantage.

She articulated,

> Maybe just to qualify that, we were both high school teachers and so we don't presume especially since we are not in the class room, it help us and gives us some credibility with the educators that we just not coming from the bio diversity background and with unrealistic expectations of what educators could do in the class room. I think that does help in some ways that we know the challenges of being in the class room and finding time. I think it goes a long way with the educators actually. I think it does help us (FGI: page 11).

They also gathered information on curriculum requirements by the Department of Education through the Curriculum Advisors which they also incorporated in designing the workshop as a whole. They were aware of the importance of working with the curriculum documents and included the current curriculum requirements. Achieng explained intensely,

> For example Jane, Kasuku set up a meeting with us. She brought us the new curriculum document and he walked us through it. Because the purpose is to say fine, this is what teachers now have to teach. This is the kind of information they looking for. And they are really struggling with this. Are you as an organisation able to link in and assist teachers to do this kind of thing? So we are going to have a workshop on Thursday. Molelo and I have looked at this. Teachers have to do 2 formal assessments. So how cans this workshop that we are going to do speak to that and assist teachers in setting up their formal assessment (Achieng: FGI: 12).

At the design stage of the PDP, the PDP officials incorporated action projects as part of the PDP for the teachers. This was thought would enhance and enable teachers to be able to practice into their classrooms and reflect into the learner's portfolio what they will have learned from the workshops, Achieng verbalized

> For this project, in the Curriculum learners have to do an Action Project; it's part of an assessment process. Learners create Portfolios of their work. Our idea was, instead of doing something that sits next to the Curriculum and needs of teachers for assessment, we could actually put the two together and say, here is something that we want to achieve and that is teachers and learners looking at an Action Project together. At the same time put it in your learner's portfolios, make it for assessment purposes. At that point the Curriculum Advisors said yes, this is a very good idea (FGI: 13).

She also expressed that the department of education officials would then perform the role of helping teachers to internalise these aspects of the design

> Our role, their role is going to be, they supposes support teachers in Curriculum in their assessments. For example, every teacher will know at the

beginning of the year that this is the number of assessment I have to do. The Curriculum Advisors' job is to go and say, fine, what are you going to be doing for each one of those assessments, and does it therefore meet the standards and requirements of each kind of assessments that has to be done. So our idea was that, our partnership with the CA would do that, would assist them to get it in to the work. We definitely see it as our role and we thought by helping teachers to do something that they have to do anyway. If we kind of ask teachers what they know about local environmental issues and how to go about starting to do an action project, they don't know how to do it. So what we thought we could do is helping them to do it. And this is what we will continue to do. I don't see us deviating from this kind of thinking that we have at the moment. This is our mandate but we are linking it very strongly to Curriculum in assisting teachers to get them what they want to do (Achieng: FGI: 13-14).

From the explanation above it is clear that the Current responsibilities of stake holders within the PD programme objectives and aims were the following: The PDP officials were the managers and facilitators of the programme and were to design activities and projects as a combination of the workshop content and the curriculum requirements which teachers were to implement with their learners at school. The trainers' role was to help teachers design their projects at the training centre.

The Department of Education Officials were to help assess the projects of the teachers in the learner's portfolios. The teachers were to formulate their own contextual projects which they were to carry out with their learners and write a report on the same project to report back to the trainer's feedback session.

In a nutshell, the researcher gathers that the PDP helped to prepare and equip teachers with assessment knowledge, assessment skills, and requirement of the curriculum so as to be able to assess their own learners at school with the support of the Department of Education officials; for the reason that this was considered and diagnosed as problematic at the beginning of the training.

> If we kind of ask teachers what they know about local environmental issues and how to go about starting to do an action project, they don't know how to do it. So what we thought we could do is helping them to do it. And this is what we will continue to do... their role is going to be, they supposes support teachers in Curriculum in their assessments. For example, every teacher will know at the beginning of the year that this is the number of assessment I have to do. The Curriculum Advisors' job is to go and say, fine, what are you going to be doing for each one of those assessments, and does it therefore meet the standards and requirements of each kind of assessments that has to be done (FG:12A-13)

Example of problem solving for teachers- as described in Life Science assessment tasks. So for the teacher to decide where the assessment comes in is always problematic as has been diagnosed by the PDP. So the PDP then comes in as an intervention in helping teacher on how to go about this

> Let me just pull out this one out as an example: Assessment practical investigation of an ecosystem in the local environment. (First part unclear) At least the first and the second term to determine the influence example temperature, rainfall on plants and animals. Selected a-biotic factors should lend itself to quantities measurements from which tentative influences about the (word unclear) of the biotic components. Teachers look at this and say, what the hell. Where can I take my learners? Where's my local Environment ecosystem? That is where we come in and say, this is potentially what you could do as kind of activities (Achieng, FGI: Page 15)

This illustrates how integration is done in life science and EE and the programme itself. They had six workshops and the following were what happened as generated from the progress report document obtained by permission from the PDP officials.

**Workshop 1. Biodiversity**; The workshop on biodiversity took place on the 16th of February 2008, the resources used included: *Africa Invaded by GISP*, *Biodiversity Convention* By the PDP- learners' Book and Educator's Book, *Resource Directory*, By City of Cape Town *Veld and Flora* March 2007 issue with a focus on threatened plants. This workshop was attended by 6 schools and 9 educators. The PDP official communicated with one of the advisors about the attendance and requested if they could contact the existing schools as well as additional schools that could potentially participate (Progress report: December 2007 to June (2008). The PDP officials met with one of the department officials to see if they could invite more schools and repeat workshop one. This workshop was repeated on the 1st of March 2008 as more educators were selected, i.e. five more schools and six educators.

**Workshop 2: Sustainable Development** - 15th March 2008:

One of the PDP officials reviewed a large selection of information about sustainable development in order to determine the appropriate content for the workshop; The workshop was planned, resources created and worksheets copied; information about sustainable development was copied and collated into information booklets for each school; schools also received the following resources: Packs of plant cards; old magazines that was funder had sourced for the educators to cut out pictures and/or use the information in the articles. This workshop was attended by eleven schools and eighteen educators (progress report to the funders, obtained with permission).

**Workshop 3: Global Warming and Climate Change -** 19th April 2008: Adapting to Climate Change in the CFR the heat is on Learning about Climate Change, Earth, The Power of the Planet, Earth Then and Now, A short history of practically everything. The workshop was planned, resources created and worksheets copied. Each school received copies of the book "Learning about Climate Change" and the DVD "An Inconvenient Truth". This workshop was attended by eight schools and thirteen educators.

**Workshop 4: Active Learning Framework, Scientific Investigations and Science Process Skills -** 17th May 2008

The PDP official read extensively around the Active Learning Framework and the process of Scientific Investigations in preparation for the workshop; The workshop was planned, resources created and worksheets copied; The Power Point presentation was copied as notes for the educators because they needed to use the notes during the main activity of the workshop (using the Active Learning Framework to develop a hypothetical project). This workshop was attended by seven schools and ten educators.

**Workshop 5: Site visit to W Nature Reserve** - 31st May 2008

The PDP officials contacted the conservation officers of W Nature Reserve to get permission to visit the reserve and to arrange for security for the morning; Two PDP officials facilitated the site visit. This workshop was attended by eight schools and eleven educators.

**Workshop with educators** - 7th March 2009

All arrangements were made for the workshop; it was attended by only 3 schools (four educators. Due to the low number of schools present, a discussion was held with the participants and the decision to postpone the selection for WEEC was taken. As Achieng was away in Durban during the following week, the selection process was postponed till the week of the 16th March 2009. One of the PD officials worked with two educators to assist them with refining their action project. Two projects from two schools were not at the stage to be included in the selection process for the World Environmental Education Conference. Only the four schools projects were ready to form part of the selection process for WEEC.

**Workshop with educators** - **18th March 2009**

Achieng contacted the educators of the four schools who had submitted their project to remind them about the workshop. Only three schools attended and presented their projects;

High School B was the school that did not participate. The selection of an educator to attend the WEEC was completed; the educators were to be notified in due course pending approval of the funding from 'Harambee'

The workshops aimed to: Build educators content knowledge about the topic 'biodiversity'; Allow educators to investigate where and how this topic fits into the National Curriculum statement (NCS); Expose educators to active, learner-centred approaches to learning activities on the topic through their participation in demonstration teaching-and-learning activities in the 'Kirst Garden' and Assist Educators in developing their own lessons on the topic. The **four workshop objectives** are applied through the **six workshops** except that they are applied to **specific workshop topics** as outlined above. Basically these forms the working objectives of this specific PD programme workshops.

### 4.1.1.9    Challenges faced by the PDP:

Under this theme, the researcher intends to analyse data that describes the difficulties that the PD experienced with regard to implementation, putting into use, and what action they had planned to do. These include factors that influenced the operation of the professional development that they envisioned to do. Diagram 4-3 is a visual presentation of the challenges the PDP faced followed by the discussion.
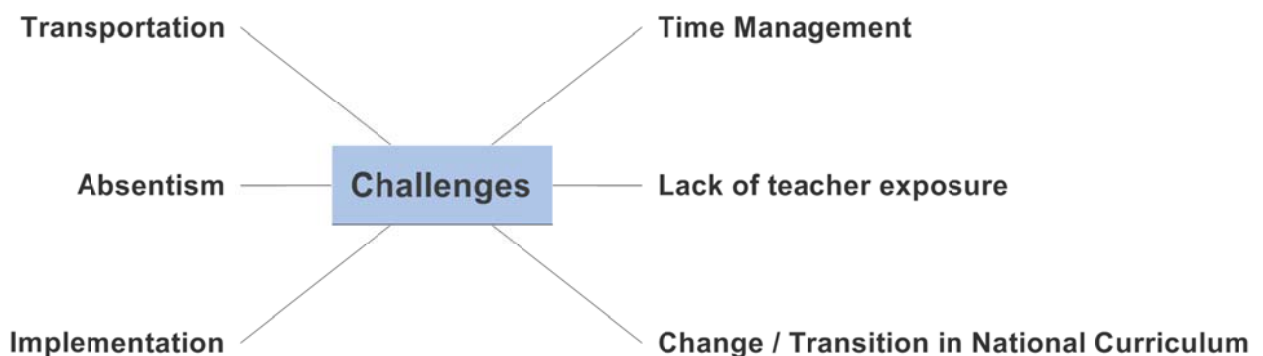


Diagram 4.3: Challenges faced by the PD officials

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### 4.1.1.9.1  Absenteeism:

Absenteeism was one of the challenges that the PDP experienced. Absenteeism here refers to teachers who did not attend sessions of the workshops for one reason or the other. The respondents reported that different participants were absent for various reasons. One participant stopped attending because one of her relatives died, another one was absent because she was overwhelmed by responsibilities so she just stop attending; others stopped attending because of negative attitudes. The general reason for absenteeism or lateness was also described as lack of transportation to the venue, because during the day that the workshops were running public transportation was a problem unlike the weekdays when public transport is available. Some did not attend due to lack of transportation. Some teachers also sent substitute teachers if the ones that were attending the workshop earlier failed to attend for one reason or the other. The other reason for absenteeism is because the centre for the training is far away from all the participants. Betty explains

> Every single workshop every time they were here.  There was one school where one teacher couldn't make it so they sent another teacher. There was one school where the teacher's mom had died and she was (word unclear) from the project.  There was another who I think was so over whelmed, she just stop coming. (Unclear)  And eventually he said he's just too busy at school; can't continue with the project.  So there is a bit of a mixture.  Those who really found value in it really enjoyed it.  I mean... again there was this transport issue which was an issue.  Unfortunately that did affect a number of the Xhosa schools rather than those who were not Xhosa schools. This is very often a problem (Betty, FGI: 16).

### 4.1.1.9.2  Transportation

Transportation was also a problem because this led to lateness of workshop attendance and sometimes they had to either repeat the workshops or cover a certain part of the work they had planned to cover for the day. Betty gave further details;

> There's very little public transport here, especially for example on a Saturday.  The week days it is difficult, but on Saturdays it is impossible.  Just maybe Achieng, with trial and error we came on the Saturday morning workshop phenomenon which did improve attendance generally.  Because to try to do what you would do in five or so hours on a Saturday, you would need three afternoons. The educators can only get away from school at a certain time.  By the time they got hear from areas which can be up to an hour away, it's already three or later.  Many of them really need to leave by half past four when it is still light, especially if using public transport.  In fact, I think generally with teacher workshops, that was a lesson we learned very early on which actually did improve the chance of people attending and getting value out of a concentrated session where they will not missing a beginning and an end every time (Focus group interview).

### 4.1.1.9.3 Lack of teacher exposure; level of education and teacher academic background

The lack of exposure was also a challenge in organization of the programme Betty specifies

> [...]particularly in the education sections from the old systems where in fact, perhaps the training was really not design towards skills as well as... And where educators often, because of the socio-economic conditions of their schools, had never been exposed to field trips and that type of thing which would lead in to the new way of doing things. Therefore we found that the application of that type of thing was very difficult for educators who themselves, neither in schools, nor in their training, have ever been exposed to it (Betty, FGI: p6).

Achieng adds the following;

> ...when we started our first batches of workshops and exposed the teachers to the curriculum documents statements they were lost; it was as if they'd never use this documents in their entire life (Achieng, FGI: 6)

### 4.1.1.9.4 Change and transition in the national curriculum:

Transition into the new curriculum was one of the driving factors that necessitated this PD programme. Prior to the commencement of the PDP, the PDP officials had to ensure that the teachers attending the workshops would understand the new curriculum and certain aspects presented at the end of the workshop. In doing this they had to help the teachers at the onset of the programme to interpret and understand the new curriculum in order to necessitate the rest of the PDP processes. Moreover, These changes in the curriculum has also increased the workload of the teachers, therefore teaching has become more intense, the workload and schedules increased and Saturdays that were considered to be precious off days, are now being sacrificed for training and workshops.

> But still, it's a huge amount of dedication from the teachers to give up a Saturday to sit in a workshop. I don't know if you know anything of teaching at the moment. It's a hectic job. Weekends become like gold (Achieng, FGI: 17).

The change in the curriculum was also a challenge for the PDP officials as well as the teachers, because the PDP did not remain prescriptive, while on the other hand teachers were struggling with fitting the workshop take-up into their daily routines at school and time become a problem in implementing action projects. On the other hand teachers were not sure whether what the PD P officials taught them formed part of the curriculum. This explains it in detail,

What did happened in one school, where Achieng was falling off the project and she kept on saying she hasn't got the time for it. The principal is pressurising her – she needs to finish her Curriculum first. I kept on saying to her this is the Curriculum; this is something you have to do. The choice is can I just do a quick small little Action Project with my learners, or this big thing that I've created for this programme? And the alternative? I want to do this one quick, quick, quick because this big one involved taking the learners out to go and look, doing investigation. I don't have time for that big project, but I might have time for another little one. I think that is what happened (Achieng, FGI: 18-19).

The above description also indicates that there was a problem with communication of programme aims and objectives to the teachers.

**Implementation of programme**: PDP description of curriculum implementation in schools does not seem to concur with teacher's outcome, take-up and understanding the relationship of what the PDP did and what is expected of them to practice at school. Teachers do not see implementation of PDP uptake as part of their daily teaching curriculum requirement, thus they had rather hurry up to finish what they consider core and essential to the curriculum leaving out the training sessions they had from the PD.

This programme involved teachers from two metropoles; this resulted into isolation of schools and lack of interest generated. The PD officials assumed that educators would know how to implement strategies once they were back at school. This unfortunately did not happen. Problems occurred when teachers were asked to present their action projects. Only three schools were present. It became increasingly more difficult to visit teachers in classes. At one point one of the Education department officials was keen about the project but along the line lost interest, moreover, even the other officials that were interested at some point were not available especially for monitoring and support functions. In implementing action projects access to sites delayed initial activities since permission was needed by relevant departments. Moreover, they express that the school structure (timetable) is not flexible enough to accommodate or allow educators time to do site visits during school day. It was also difficult getting grade ten teacher to get together and be involved. Water testing kits were faulty and alternative measures had to be taken.

**Reflection:** Teachers, department of education officials and the PDP officials say that the programme was for three years, what is reflecting more is one year. What happened in the other years? Except for one school? Most teachers say promises were made that were not fulfilled; they have not been called back for feedback sessions, what's going on? If time was a problem, then the workshops could have been well spaced within this three years so that

teachers have time to plan and think over their attendance. Again, projects could have been identified earlier at workshop in order for them to work alongside with their projects for presentation before implementation, some teacher indicate that they were not able to present any project plans at all, yet this is a core objective as have described by the PD. There is an area of reflection!

Time allocation for workshops was also a challenge as teachers had to lose their precious resting time and family time for a PD programme; something that drained their efforts and strength in their daily work at school and recreational time. The time allocation also affected the availability of transportation for teachers. This in turn led to absenteeism.

### 4.1.1.10    Lessons learned by the PDP Officials:
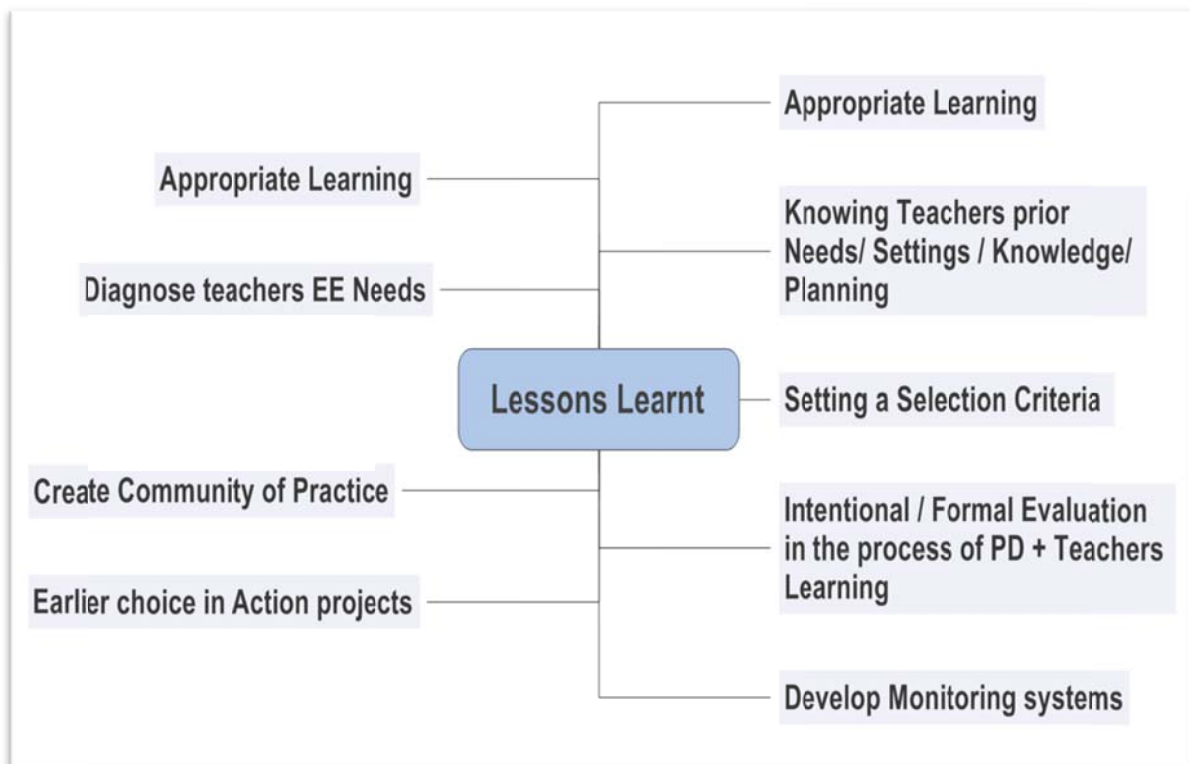


Diagram 4.4: Lessons learned by PD officials.

- PDP officials learned and discovered that identifying the weaknesses of teachers' responsibility in teaching EE is an important aspect that requires consideration in the future in order to plan appropriately and address such core issues as this in their workshops in the PDP.
- Environmental education history of individual teachers involved in the PDP is essential in developing a baseline for curriculum development in EE.

- They learned that in future selection of teachers they would develop a selection criterion or do selection by themselves instead of asking the educational officials to choose, since they were involved in training Lead teachers.

- They learned that in the future, they will develop a criterion for evaluation that will enable them to assess take-up and teachers' progress at some point to just know whether they are at par with the programme requirements and a par with teachers learning.

- They learned that developing some monitoring system of the PD in the future will go a long way in helping them as well as the educational department officials to monitor the PDP progress.

- They also learned that choosing at an earlier stage the action projects that teachers would do will go a long way in helping them assist teachers in developing their projects gradually, in order to systematically carry them along through each of the workshops.

- They learned to create a form of community of practice among the teachers so as to facilitate their up-take and future sustainability of action projects as the teachers had diverse backgrounds which would definitely assist teachers' personalities as lead teachers as envisioned by this PDP( PDP Review document, 21).

### 4.1.2    Department of education officials: - Support Partners:

At this stage the researcher discusses themes as they emerged from department of education officials. Understanding their placement in this professional development programme will enable me to evaluate the factors that influence take-up of teachers and the roles they played to enhance professional development that the PDP envisioned**.** I intend to understand the Background of the departmental officials with regard to EE; their roles with regard to EE and life sciences integration; their involvement with this PD programme; the criteria they used in selecting teachers into the PD programme; the kind of support and follow they gave to ensure take-up and implementation of the PD programme processes; do they think an intervention like the one this PD programme had is necessary? Whether they have been directly though the training of the PDP; specific things they think needs to be improved in order to improve the sustainability of the Programme; suggestions they may render in order to improve the liaison between, teachers in the PD programme and the PDP officials as an intervention: Below follows the themes that emerged from Department of Education officials.

### 4.1.2.1    Roles of the Department of education officials:

In Diagram 4.5 I summarise the important aspects of the workshop programme I extracted from my research with co-ordinators and developers of the programme regarding the roles proposed roles of the Education department officials.

Research Consultants

Participants

Selection of Participants

Provide Support

Ensure projects meet scientific criteria

Create awareness of PD Programme

Roles of Department Officials

Create Further opportunity of PD for Teachers

Link between PD and Teachers

Check allignment with Curriculum requirements for teachers

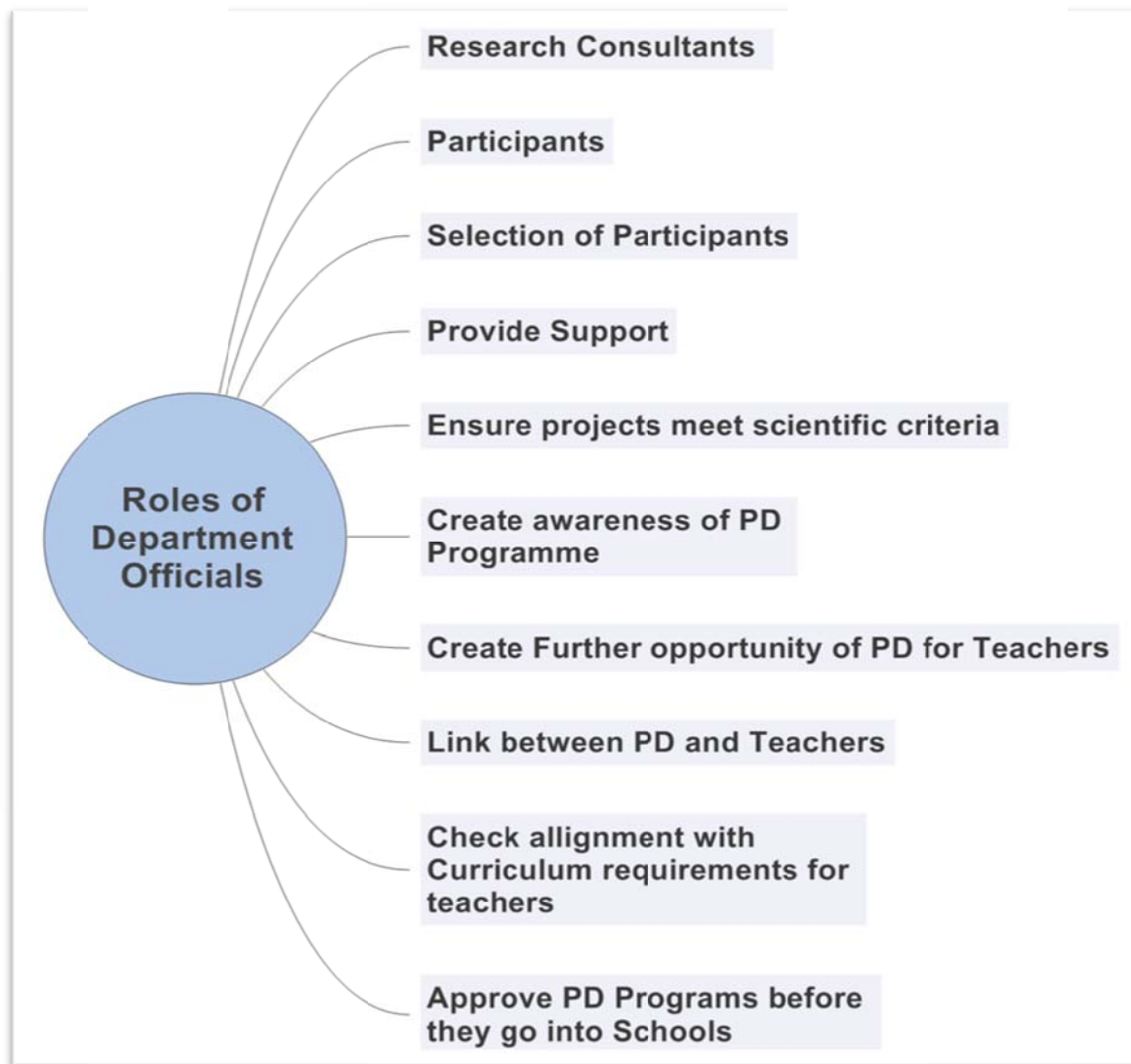Approve PD Programs before they go into Schools

Diagram 4.5: Roles of thee Department Officials

Kasuku was part of the writing of the programme proposal. He formed part of the team that began the programme as they had funding.

> […] at that stage, I was the Life Science's Curriculum Advisor for FET,
> Further Education Training Sector that is Grade 11 and 12. It was me and

> Ngugi[8], and Achieng[9] who brainstormed this programme because Harambee
> [funder] was interested in funding an FET programme. Consequently the three
> of us sat down and we looked at putting together a proposal to present to the
> Harambee fund… (Kasuku[10], 3-4)

His other role was **a research consultant**; he made sure that the proposal was academically rigorous. This gave him the synergy because the other partner was more gifted in practical issues in the teaching profession. "My role was to bring to bear my understandings of theories of Teacher Professional Development… So my role was to a large extent in the initial stages as a research consultant…" (Kasuku).

He played a role in being part of the initial meeting the PD had in **formulating the programme proposal** and the funders were also part of these meetings as they played a role in shaping the proposal. Kasuku affirms, "Very much we had an on-going meeting with Jarenga[11] who was at that stage the head of Harambee[12]. Obviously he stepped down and this new person took over. No, Harambee have been involved in formulating the proposal with Achieng and Ngugi…" (Kasuku, SI: pg 5). Other roles he played were:

1. He was to be **a participant at the workshop** and **selecting the teachers** that were to be participants in the PD programme within his district. In selecting teachers his criteria was that: the teachers must be at stable schools; the schools must be schools with stable management team that is functioning well; the teachers must have interest and passion for environmental education and he also looked at individual teachers' capacity and intent in learning and teaching children. He determined these through their truck records and from his long experience and involvement in Environmental Education.

2. **Provided sustainable support for teachers:** He also acknowledges his role as a sustainable support system for teachers at school which never happened in reality, due to the many responsibilities that he did have as a Curriculum Advisor. He admits that he had the mandate and permissions to visit the schools but the responsibilities are enormous.

   > The idea here is this, as a curriculum advisor I could be the sustainable support system at school. Even in reality it never works smoothly. Keeping in mind, I got a number of responsibilities and in theory as clean and simple as it might seen, these are schools in my district so I can go and visit them. Unfortunately my job doesn't speak that way (Kasuku, 5: SI).

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[8] Pseudo name

[9] Pseudo name

[10] Pseudo name

[11] Pseudo name

[12] Harambee is a pseudo name for the PDP main funders.

As far as the Professional Development Programme is concerned he was a non participant. He was not a presenter at all; he was only there at the beginning of the proposal formulation and he would also be there as far as evaluation is concerned with the director of the programme. Other role he played include:

**4. Ensure that projects meet scientific criterion**: He also calculated year marks including the research projects which they require to follow a scientific investigation process so; he ensures that the projects' meets up with the requirements of a research project.

**5. Create awareness of PD programmes in schools:** Curriculum Advisors played the role of creating awareness of the programme in the schools through the school management. They also ensured the continuity of the PD programme by recommending teachers who were part of this programme to attend other international environmental education programmes organised in South Africa. He also selected a teacher who participated in the programme to present a project in the world environmental congress.

6. **Create further PD opportunities for teachers:** He thus created more opportunities for teachers to deepen and widen their horizon of their understanding of environmental education.

> That is what was going to be needed to be successful to a large extend to ensure that the management of the school supports the project that the teachers are involved in. What I also did, I'm involved in an international project called Global Environmental Teaching, with the University of (Name unclear.) This is an exchange programme with teachers moving. Last year they were here (part unclear) but then I ensured that the number of these teachers that's part of this FET-programme was also on that programme. My role is to create extra opportunities for these teachers to be involved in different environmental education process to deepen their understanding (Kasuku, 7: SI).

7. **Lead and advice teachers on EE outcomes in Life Science**: to ensure that teachers are aware of the Environmental Education outcomes and are able to integrate EE outcomes in Life Science. Peter illustrates the importance of integrating EE and life science as he describes the position of EE in Life science curriculum. He says there is provision for EE in Life Science in curriculum. He identifies the impact of Life Science on the environment.

8. **Help and render support to teachers to translate learning outcomes by writing skills to make** it easier for them to identify the outcomes. This implies that Curriculum advisers are links that enable teachers to see the relevance of the PD training in their daily practices as life science teachers. They ensure that the teachers understand the curriculum alignment with PD outcomes.

*Reflection:* Departmental officials can only do this if they have wider lenses of viewing EE and its relationships to Life Science and PD training contents. Thus, it is plainly essential that they are part of what teachers do at the PD workshops. They needed to have to some extent ideas of knowledge of how, what, the teachers have acquired from the PD. Like Peter admits that he has only attended a few of the workshops that teachers he selected attended so he does not have much of the ideas of what the teachers did, so how will he be able to support and monitor the teachers without this knowledge and understanding of what the teachers are to implement? "Myself no, I just happened to attend a few workshops with my teachers there but not as being trained. I have attended some workshops of global warming and those things" (Peter[13], SI: 7). He says that he has never attended the workshops and then contradicts his statement when he says again that he attended only one workshop on Global warming.

Further themes that emerged from the Department Officials Diagram 4-6 illustrate a combination of themes that emerged from the data from department of Education officials. The themes connected by the arrow indicate links and connections of the themes. There are also themes that emerged as pure strands that stood alone as major themes that I could not merge further, but were very important in addressing my research questions. Explanations of these themes are further presented below.

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[13] Pseudo name
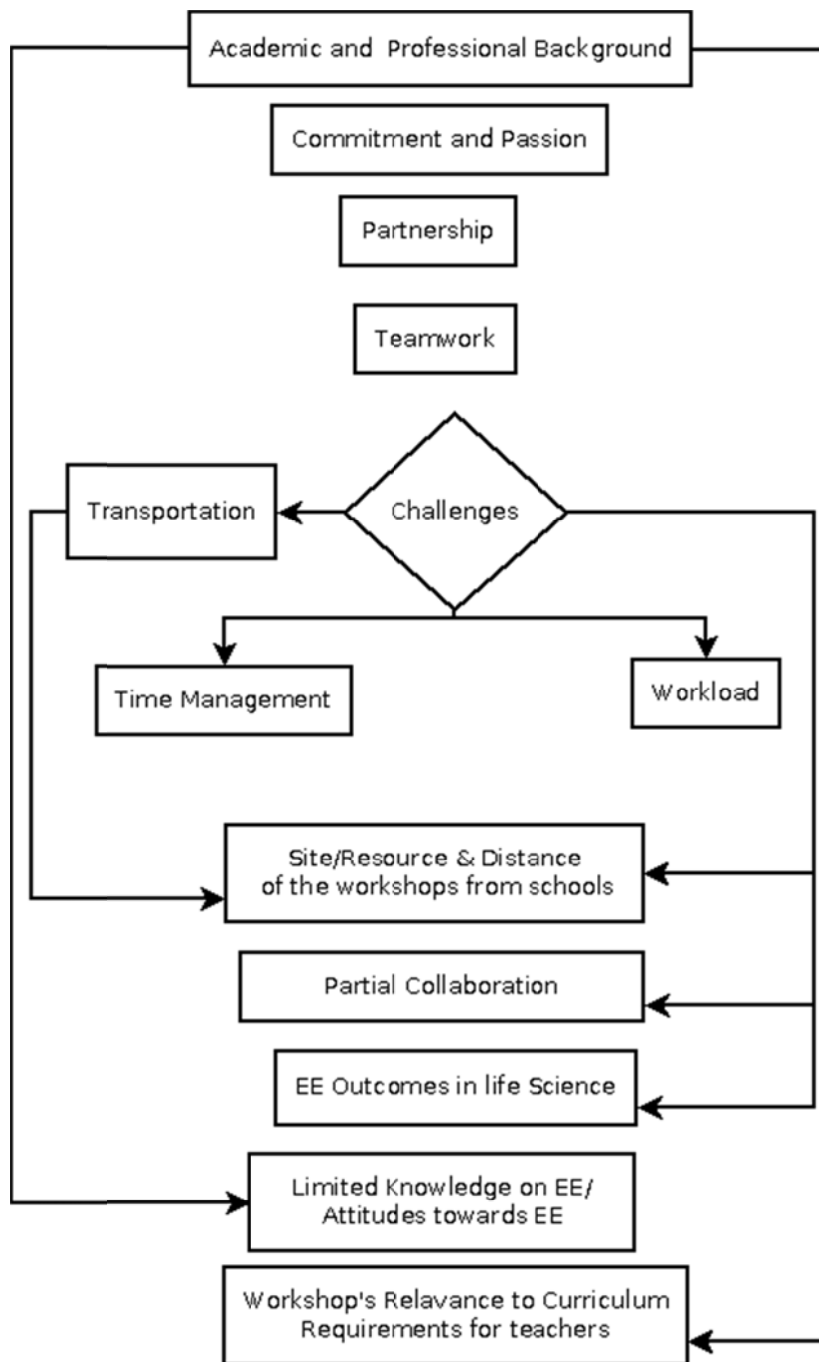
Diagram 4.6: Combination of themes that emerged from Department Officials.

### 4.1.2.2   Limited Knowledge in Environmental Education/ attitude towards EE:

Peter recognizes the importance of EE and points out how important EE is and how it is reflected in the curriculum of Life Science but goes further to contradict himself by a statement that poses a negative attitude, and little concern about the vitality of EE when he says,

> Yes, look I think Environmental Studies forms an integral part of our curriculum in Life Science. It is actually one of the topics that should be covered right through Grade 10 up to 12. Yes, in that way it is quite integrated in that as well as our learning outcome is Outcome 3 makes provision for Life Science and the Environment. Even technology comes in here; especially the role or impact of Life Science in the environment. So yes, our Curriculum makes provision for the coverage of Environmental Studies. Very small but it is there. So in that way I think with our Learning Outcome 3… (Peter, CA. SI: 1).

He pays less attention to environmental education concerns as his focused on poor performing schools. An attitude that neglect EE which might actually improve performance of the poor schools that he is busy with. He however, blames lack of collaboration as a stumbling block to his monitoring the implementation of the PD projects in the schools.

He does not see his role of monitoring this project as his core business and so encapsulate none of his time. He also sees this programme as a special project but he needs to be informed of the programme's progression in order to be fully involved.

> They held a lot of meetings but I might not have attended it because of my time. Sometimes you have to draw a line between your business and other special problems you understand? I'm still a departmental official I need to do my core business. I can run special problems but I must be fully aware of it from day one to the end of that project (Peter, SI: 13b).

The department official also admitted his limited knowledge in environmental education; however, he is open and willing to learn. He submits that a PD programme like this one is vital and pleads that it should not stop. Moreover, he encourages that the programme should cover more of the disadvantaged schools as they hardly have time, finances to go out for PD programmes.

### 4.1.2.3    Lack of knowledge about PD Objectives:

In this theme the researcher intends to explain the theme as it emerged from the data. A department official was asked to render suggestions that might be of benefit to and improvement for the PD programme; in his response he indicated lack of knowledge and awareness of the programme objectives, when he suggested that learners should be part of the programme. However, the programme objectives are clearly stated by the PD programme as training life science teachers in the FET within 10 schools in selected districts. On the other hand it also triggers the notion that maybe the objectives were not communicated effectively to the department officials. Whatever the case, it comes when he says

> [...]  Maybe even organising something for learners.  Something learners, in my district, they never get to places like...  There's a lot more out there. Maybe if they can arrange stuff like that short training sessions for learners so that they can get involved and seeing more opportunities.  Then some teachers who became facilitators. Let us give the learners the chance also you know? Not the teachers.  That would be one suggestion.  The other suggestion is that they might form part of our Life Science community so that we can plan together any project they come up we can plan as a team.  It shouldn't be them there and us here because it will not work.  I know with last time's project. They came in, they explained what they want to do, I got the schools and it stopped there.  I couldn't attend most of those workshops because of; it wasn't within my programme... (Peter, 16a...17b).

### 4.1.2.4    Bureaucracy:

In building collaboration with the PD programme, the department officials indicate that there is a possibility of PD managers going into schools and into classrooms, but that they must do this through the district office. They must follow the protocols in order to get permissions to reach schools. This is to ensure security in schools otherwise anyone can just enter schools,

> There's always a possibility like that but then they need to come to the district office.  What happened in the previous project, they came to the curriculum manager and with me.  They came up with their ideas and also if they can go in to the schools.  They have to work through the necessary channels.  They can't just go out to the schools.  There's a protocol.  I think they must get permission from the office.  I think it is more a security otherwise everybody can go in to the schools.  I get there as an adviser and how the teachers is confused.  That happened.  It's better for them starting something in schools to go to the right channels.  I cannot give them permission (Peter, 14a-15).

### 4.1.2.5    Role confusion:

When asked about his roles with integration of EE and Life science, he describes the availability of EE in the curriculum which he is not so sure about, when he uses the word "I think…"(Peter, SI: 1-6) several times. He goes further to explain the various changing trends in curriculum outcomes in life science and indicates that there's **very small portion** of EE in a life science curriculum and is not sure, not optimistic about the New Curriculum inclusion of Environmental outcomes; an expression that agitates 'less concern' hence negative attitude. He does not actually say what his role is with regard to the PD programme.

### 4.1.2.6    EE Outcomes in Life Science:

This theme explains what Environmental Outcomes in life Science is from the perspective of department of education officials. This portrays the availability of some of the elements the respondents see as integration of EE in life Science. The respondents explain outcome three in life science as an integration: "recycling and environmental aspects with is one of the outcome in technology and education as well as in life sciences" (Hamisi, SI: 2) other components in the integration that came out were: fossils studies, evolution, plants, sand animals, biodiversity, and applying Life Science in society; indigenous knowledge and knowledge of industry and career.

It is important to know that the department officials are aware of the presence of EE outcomes that are integrated in life science.

### 4.1.2.7    Relevance of the PD programme to Curriculum requirements for teachers:

Peter, after attending a session of the PD workshops 'global warming' agrees that the workshops had a lot for teachers (information?). He also indicated that the workshops were well facilitated. "The few I have attended, I think it was well facilitated.  I think there's a lot in it for teachers" (SI: 7).

The Department of Education need partnership with an organization like this one to do professional development for teachers. They depict too that the department had been in crisis management not professional development so this programme is a "stitch in time that saves nine".

> Professional Development by partners that I've been working with will always
> be important.  The challenges of on-going Teacher Professional Development
> are huge and the District can never do the function on its own.  To large extent

we do crisis management. We don't really do Teachers Development with all these theories and principals. So if an organisation like this PDP with people that got the necessary background to do it, I personally would welcome their continuing in this field to supplement what we do; working with a few teachers in an on-going way over time. So yes, I would love them to continue (Kasuku, SI: 15).

### 4.1.2.8    Duration of the Programme:

This theme emerged as a description of the interval that the PDP was planned to commence and when it was to culminate with the same group of participants. The respondent reveals that during the training programme, the same teachers attended at least three years. He also tells us the nature of teachers that were to be involved in the programme – life science teachers who teach at the FET phase of schooling.

### 4.1.2.9    Academic and Professional Background:

The respondent indicates how academic and work experience and involvement have affected his role and partnership in this specific professional development programme. He is a trained Environmental Educator, has been involved in various areas in environmental education both as a leader, teacher, presenter, colleagues and researcher and this enhances his involvement in this Professional development programme that this research is evaluating. He says:

> In 1992 I started my M-ED in Environmental Education at Rhodes. At that stage I was at a high school and I work with a number of teachers in research and Ngugi was one of him…My interest in Environmental Education also comes along for a very, very long; being involved at different levels – international, national, provincial, local So, me meeting up with Ngugi and Achieng was part of my involvement in the community of Environmental Educators (Kasuku).

His position in the Department of Education enhanced the partnership between the PDP and the department.

### 4.1.2.10    Commitment and Passion:

It appears from this data that commitment and passion in environmental education enabled Kasuku to be able to be involved in this project despite the workload and the job descriptions that awaited him; he did it in such a way that even though he was stretched by responsibilities he remained enthusiastic and dedicated to an extent. He explains further

> Keeping in mind as an official I have a lot of responsibilities and Environmental Education is an additional responsibilities. So although I might have an understanding of Environmental Education, I might have the passion, but I don't have the time to teach Professional Development in Environmental

Education. Consequently I have partnerships with organisations there (word unclear) to the actual work. And this is the relationship with PD (Kasuku: pg3: SI).

### 4.1.2.11 Partnership

The respondent specifies a long standing partnership which is strengthened by a long standing professional relationship with the PDP managers. The relationship between them also developed when both the PDP managers were head of the Biology Department. He maintains that this understanding of the relationship is an important aspect of his involvement with the PD programme. Kasuku explains his partnership in this PDP

> […] my involvement with the PDP has been a long standing partnership. This is important to understand that there is a social history between the individuals at 'Kirst' (Pseudo name) and myself. Both Achieng and Ngugi[14] were Biology head of departments at two schools of which I was the Curriculum Advisor (Kasuku, Semi-structured interview).

He points out that quality in partnership is essential and integral to success of any PD programme. He thus contends that this enhances a common vision between the partners. That is, since they had a standing relationship, they developed a similar Educational goal and vision toward developing this PD programme.

> …You need to have that to have a partnership programme. That makes the quality of the partnership because we have a long standing relationship, we understand each other, we have a common educational vision.., and that, I think, enriches that… (Kasuku, SI).

He reveals the fact that in partnership it is important to note the variety of abilities and giftedness of the individuals in the partnership. He was more academically rigorous in terms of theoretical aspects of the programme while the other counterparts were more gifted in practical issue in teaching profession as well as more into funding and had built more close relationships with the funders. This ideal made possible for the collaboration in this programme partnership, Kasuku rightly puts it

> So my role…looking at the proposal and making sure that it is academically rigorous. It was a nice synergy because Achieng knows the practical issues about teaching Professional Development. Ngugi also knows what is possible because Ngugi had a close relationship with funders [Harambee] (SI: pg4).

Data also emerged that this PD programme did not only involve only life science departmental officials but also technology advisors. Hamisi maintains, "What we would do is

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[14] Pseudo name

at particular workshops we would we would tap in to one another's resources. We found that a lot of our teachers of Technology were actually Science teachers" (Hamisi, Interview).

### 4.1.2.12 Data here suggest wrong partnership:

Hamisi[15], having been mentioned, put forth as one of the officials from the department of education that were involved in the PD programme, says nothing relevant to the PD programme. Hamisi does not seem to have an idea of what this PDP is all about. According to the semi structured interviews the researcher had with him, reveals that what he is involved in is very far off with what the PD programme's intentions, objectives and aims are with regards to developing Life Science teachers. He seemed to have been involved in something extremely different from what I understand this PD programme to be involved in. Hamisi explains that the PDP has something to do with biodiversity and nothing beyond that, as his specialisation has nothing to do with life science.

### 4.1.2.13 Team Work:

Team work as described in the data refers to working together with a common goal everyone playing their role while ensuring the welfare of the programme with continuous interaction, communication of the programme progress. Peter instigates lack of team work among the PDP organisers and the department officials. When he says

> The University of Tilapia is quite involved in our Life Sciences meetings. I don't think this PD programme was so much involved in the past. It was once-off projects you see? Even if they can works through us as *a team* we can see how we can accommodate them. It is actually good to work with a group of advisers within the districts... they might form part of our Life Science community so that we can plan together any project they come up we can plan *as a team*. It shouldn't be them there and us here because it will not work (Peter, 15a...17b).

### 4.1.2.14 Collaboration:

Collaboration as featured in the data to be lacking between the departmental officials and the PD programme officials. Collaboration should allow a tool for monitoring. It should also be inclusive, that is to say that all stakeholders should be equally involved in the programme doing their various roles optimally. Communication of roles should have been done to enhance implementation and monitoring of the project. There should be a shared common goal and interest among stake-holders. Peter suggests

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[15] Pseudo name

My suggestion would be, maybe it would be nice to have a collaborative project between me and the project, the people who implemented the project. I hope I answered your question. I'm not saying that I didn't monitor because I'm talking my favour... There should actually be an on-going; while the project is run there should be an on-going almost like meetings and collaboration between us. It shouldn't be just a once-off. So I'm actually pleading for collaboration between the project managers and the Department itself (Peter, SI: 12a...13a).

### 4.1.2.15   Challenges of implementation- Curriculum Advisors' perspectives:

Implementation at this stage refers to the support system that was to be provided by the department of education officials. They were to help teachers ensure that what they learned from the PD programme is implemented in schools and that it is reflected in the learners' portfolios. The challenges here refer to those obstacles that affected the smooth running and implementation of the programme's aim and objectives with regard to the support system that was put in place for smooth running of the PDP.

From the data, it is clear that the Biology Curriculum Advisors were in demand in certain *poverty stricken* areas and the department appointed Biology advisors who *had no interest and passion in Environmental Education* and paid less attention to it. Kasuku affirms that environmental education is vital and forms part of the curriculum but that if people who are involved in it do not *have passion*, the practice becomes difficult and neglected.

Peter, affirms the availability of EE in Life Science outcomes, he says, "environmental studies forms 50% of the life science curriculum in Grade 12, while in grade 10 and 11 there is 40% of EE reflected in the new curriculum" (Peter, SI).

Kasuku is *not sure on the kind of support he has been able to accord teachers* but recognises support as essential to any PD programme to be implemented. He also acknowledges that innovations may not become a reality unless support is accorded. He admits that he would have given support and pressure by saying

> This project is brilliant; we need to make sure that you complete it by such time. To what extent I've been able to do it consistently varies, again it has to do with the reality of my work. Again environmental education is formally not my job description, and I think that is part of the challenge (Kasuku, SI: 11).

*Reflection:* as a researcher and evaluator; it sounds weird that EE is not part of his job description and yet he is a curriculum advisor in life science as perceived by the PD explanation of the role and partnership they needed from the curriculum advisers? Again, if the Curriculum Advisor understands that EE is integrated in life science and forms an integral part of his responsibility as a life science curriculum advisor, then I ask a lot of questions? Do

they understand their roles with regard to the integration of EE in Life science and its importance? This should be a motivation for the advisor to carry out his responsibility. Could it be that the PD chose the wrong partnership?

Thus the challenges become: that of time management; the workload by the Curriculum Advisors; poverty; difficulty in practice and theory; lack of passion and commitment; lack of expertise in environmental education amongst teachers and some Curriculum Advisors and lack of a favourable atmosphere at the department to carry out "extra "responsibilities. Kasuku submits that it is in the aspect of support that challenges occurred, when he says

> [...] Consequently Mathare[16] is another district. There we in a very importantly attracted Biology curriculum advisor. But because he doesn't have EE in his blood, he is not passionate about it, he slowly but surely dropped off the bus and that is part of the challenge. Although Environment is in the curriculum of the Life Sciences if people don't have the passion for it, they will not see the need for it and I think that is the lesson that we've learned there… (Kasuku, 6 SI).

***Concern and attention*** should be raised when the advisor brings to my understanding that the national curriculum in science does not actually reflect integration of EE in life science which should be the case. He categorically asserts that it is integrated but that is part of it. He adds that philosophically it sounds right but in reality it is not working: something that he says that if this is true then it should reflect on the teachers practice. He cites evidence when he says:

> It is integrated but that is part of, philosophically it's correct, but reality and practically it is not working because, if it is integrated it assumes that teachers have the knowledge to be able to see it in that Curriculum. Keeping in mind that only about 5% teachers in South Africa to a large extend, has had any formal environmental education in their teacher training. That 5% would be able to see Environment in an integrated Curriculum; the majority is not and that is part of the problem. Coming back to your question of what is the involvement of Curriculum Advisors in Environmental Education, it is very limited due to the constraints of the job description of the Curriculum Advisors. Secondly to a large extend, them not having an interest in environmental education due to the lack of knowledge in that field (Kasuku, SI: 14).

*Reflection:* This is an important thing to reflect on, especially for the Curriculum Advisors that this PD has to work with in the future. To instil practicality and reality of programme implementation of the PD should ensure that they have an orientation programme for the life science curriculum advisor to ensure to some extent that they know the kind of support that is

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[16] Pseudo name for [poverty stricken areas]

required of them and to be able to understand the integration that the curriculum requires. Otherwise it will be like they say, "digging with chicken". This will enhance awareness and understanding the adventure in environmental education so that it may be more intentional in their practice and monitoring of teachers. They need to understand and be able to render support to teachers in something that they themselves have been involved in.

It is also important that this excerpt reveals that a PDP like this one is a necessity, because it reveals that a larger percentage of teachers are ignorant about the availability of EE in life science. And that only few are able to identify EE outcomes in Life Science- Something for the PDP to ponder on. The PDP then should focus first and foremost in highlighting the importance and presence of EE as integrated in life science and then enabling teachers to be able to have knowledge, skills and attitudes of identifying and being able to implement steps that make outcomes a reality in the learners' portfolios. This will help teachers in their daily practice and they are aware of its position in the curriculum that they use and make it more intentional and not a burden or an added responsibility.

### 4.1.2.16   Transportation and distance to the site of training:

Peter expresses the difficulty the teachers in his district faced due to the 'farness' of the site of training from the location of the schools and this made it difficult for some of the teachers in his district to attend regularly and as he would have loved them to.

> I think the only difficulty for my district is probably distance related because most of the workshop was held at 'Kirst'[17]  Gardens.  So I think the distance can become quite a problem for my teachers.  Some of the workshops were at weekends.  Teachers have to drive all that way up there.  I can tell you that will always be a problem for us in this district (Peter, SI: 7).

He also suggests that the PD should move their workshop venues to the community and closer to the teachers involved. "But as I said maybe, maybe they should rethink the venue when they have these types of workshops you understand?  It's much better for teachers in the..." (Peter, SI: 8).

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[17] Pseudo name for the PDP training center.

### 4.1.2.17 Suggestions for improvement

From the Curriculum Advisors perspective, some things needs to be put right if this programme is to improve. Kasuku suggests that the monitoring and the evaluation of the implementation need to be looked into seriously.

> I think we need to look at improving the monitoring and the evaluation of the implementation. Is the Curriculum Advisors playing the best role it can as far as monitoring? Are they reflecting work with teachers to see how we can improve that? You understand? That is immediately for me the most important. Monitoring and evaluation (SI: 15).

He also suggests the manner, in which this evaluation can be more successful, and how effective it might be regarding personnel addition due to the enormous task that is already on the existing partners,

> ... What would also be good if, monitoring. If one has the time to actually go to the schools and sit in when the teachers are running the programme to give feedback to the teachers about what they are doing. So it is evaluation at two levels: Evaluation where you give feedback to the teachers on your observation and then is also evaluation to the programme itself. Again the reality is that to what extent, Achieng doesn't have the time to do that, I don't have the time to do that. Consequently one puts a proposal together and then there's enough money actually to have somebody to do that as a (word unclear) to a student or something like that. To make sure that an effect is given to quality monitoring and evaluation and not my chance is hugely problematic. Look at myself, there are about 65 high schools that I have to go to (Kasuku, SI: 16).

*Reflection:* I concur with the respondent above, and suggest that the PD as well as the Department of Education needs to see the importance of either carrying out this support or employing someone to do this, it will give them a great advantage in their PD that they have organised and then they will see the whole point of this PD.

The monitoring role and evaluation is too much for only one education department official or one trainer from the PDP to do usual training and organisational work and monitor at the same time. Getting additional help will go a long way in improving this programme. Kasuku emphasises,

> There's only one Life Science Advisor in the district and there's 65 high schools in the district. And if I must assist with Life Sciences it makes the workload even crazier, because senior phase is Grade 7, 8 and 9. Grade 7 is in the Primary Schools. We have about 100 Primary Schools in our district. So the workload of Curriculum Advisors is one of the main reasons that impacts on the quality of support that Curriculum Advisors can give. And then to compile this, next year in the new Curriculum. I'll have to support in the same

school two Curricula: the old NCS and the new NCS. It increases the workload even further... (SI: 16).

Kasuku, explains vividly, his view of EE, which I find very interesting,

Environmental Education is not just about the topic on the environment. It is the way of teaching. Because the aim is to develop critical (word unclear) and therefore we talk about teaching for action, so that the child, through the teaching process already develops the necessary skills to become a critical (unclear) now and later in his life (SI: 17).

Better collaboration in planning in the future and organising something for the learners will go a long way to enhance programme's sustainability. Peter explains,

[...] better collaboration between us in future. Maybe even organising something for learners. Something learners, in my district, they never get to places like.... There's a lot more out there. Maybe if they can arrange stuff like that short training sessions for learners so that they can get involved and seeing more opportunities. Then some teachers became facilitators. Let us give the learners the chance also you know? Not the teachers (Peter, 16 SI).

### 4.1.3  Data from Teachers:

In this section the data that emerged from the PDP participants (teachers) are discussed. Data has been discussed with regard to the themes that emerged from the semi-structured interview, and focus group discussions as were coded from the transcriptions. At this stage the researchers main aim was to find out background of the teachers; How they came to be part of this PD programme; What they learned from the PDP processes; How are they putting what they learned into practice; Are the teachers more confident as teachers in EE because of this training; Do they get further support in implementation of what learned; What would they like to see done differently in order to improve their development for the future; What are they are still struggling with in regard to implementation; Was implementation advocated, facilitated and supported; whether there were sufficient resources made available to hasten their implementation. Below follows teachers' perspectives as put in themes that emerged:

#### 4.1.3.1  Programme coverage and focus: teachers' perspectives:

Teachers understand the programme to have been involving *life science teachers*. They also acknowledge that they were the *ten selected schools*. They were aware that the programme focused on training and developing teachers in Environmental Education and those projects were to be selected within the community in which their schools were selected, in order to

implement such projects within their local schools. Cactus[18] (FGI[19]) is aware of programme aims and objectives.

Teachers indicate that, this programme is to run for three years. Sisal[20] clarify that they attended the workshop every second Saturday. The workshop to him was focused on different aspects of biodiversity.

> Sisal says the programme was allocated three years but that, except for the workshop in the first year he has no idea what happened the rest of the years, he puts it, "Was it last year? No, three years ago. I cannot remember how many lectures. In the first year it was just the workshops. Nothing has happened ever since" (Sisal, 23: SI).

### 4.1.3.2 How teachers were introduced to the PD project:

How teachers were introduced to the PD programme became an important aspect of this analysis, when I asked teachers of how they got involved with the programme. Teachers got involved in the programme in various ways, some were informed by department of education officials, others through letters, others were just asked to be part of the workshops by the principals of the school, some agreed willingly to be part of the workshops and yet others went for it because they had to go... (See the Diagram 4-7).This response and ways in which teachers were asked to form part of the programme is vital in my analysis. The question is how did this affect take up, implementation and the extent of professional development? Did this influence in any way teachers' attitudes in the entire programme? Further details and explanation are in the narration of data analysis that emerged from Teachers as participants

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[18] Pseudo name
[19] Focus group Interviews
[20] Pseudo name
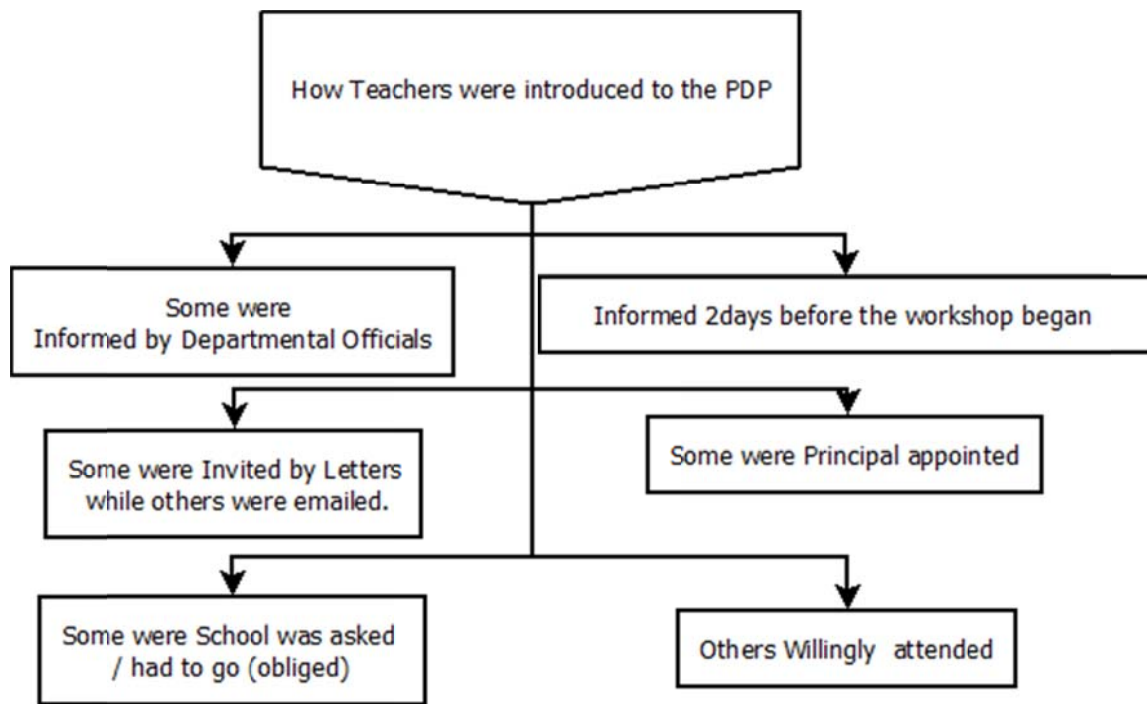
Diagram 4.7: Ways in which teachers were introduced to the PDP

Pansies even though not a head of department was invited to attend the training by the departmental subject advisor and showed interest. Rose was informed by a department official from within her school district, so she had to attend.

Cactus got involved in the PD programme through an outreach greening programme where his school was among the ten selected. He was invited by one of the PD management officials a few days before the training began. "… My advisor didn't contact me at all. I was selected for this project two days before the project started. I met Ngugi during the Environmental Course" (Cactus: 11: FG).

Teachers were also invited to the PD programme via letters sent by the department of Life Science in which they were asked to accept by the then acting principal of the school. Daisy[21] and Eucalyptus[22] were invited to PD programme via letter; through the department of life science and they were asked to go by the then acting principal of the school.

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[21] Pseudo name
[22] Pseudo name

Cyprus[23] saw the PDP as an opportunity to grow. She was informed about the training by the department of education official from her district. She willingly grabbed the opportunity to be part of the training. She had enough information about the programme to convince her to be part of it. For her it was a voluntary participation. Sisal was invited to the workshop through an email. Three of the teachers were invited to the workshop on Biodiversity but only Sisal was willing to attend as the others were not keen about it.

### 4.1.3.3 Programme coverage - teachers' perspectives:

The diagram below (4.8) represents teachers views of how they understood the programme focus and what the programme aimed to do. Teachers understanding of programme focus and coverage will enable me to evaluate teachers' understanding of the programme intentions and their sentiments of the programme in general. Below teachers see this programme aimed at Life Science teachers, with a delimitation of ten schools consisting of fifteen teachers. Teachers understood that this programme was to help them understand how life science and environmental education is integrated. They also acknowledged the fact that they had a responsibility to present action project at the end of the training which they were to reflect in their learners' portfolios. They understood that a stronger link of this study was concerned with biodiversity as a main focus. They also were aware and agreed with the time of training that was scheduled for Saturdays.
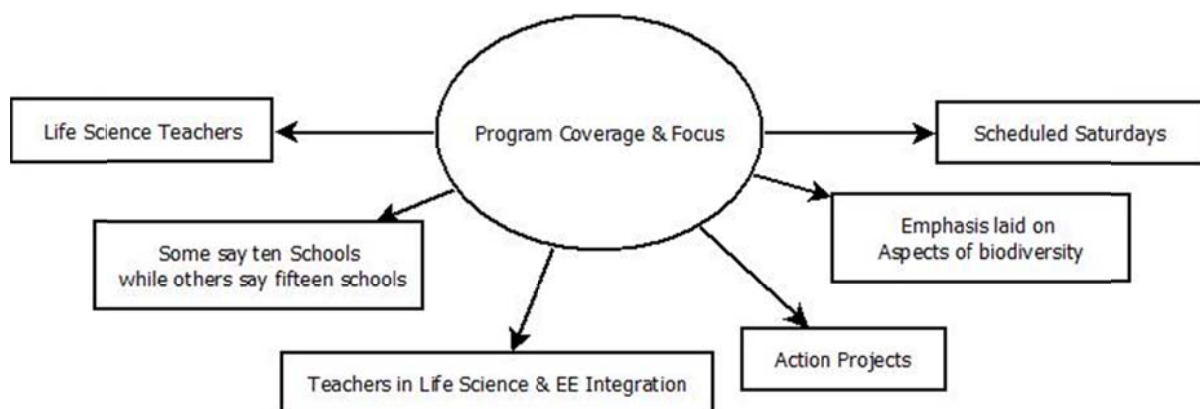


Diagram 4.8 : Programme coverage and focus as described by the teachers.

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[23] Pseudo name

### 4.1.3.4    Take-up:

In this section, the researcher will code data that emerges as a form of learning that teachers displayed, either through the knowledge they acquired, change in practice from their initial way of teaching and learning that they implemented, action projects that were actually implemented or artefacts that the researcher observed as PD programme outcome or some form of up take from the PD programme in its entirety. The diagram below (4-9), represents take up as described by the teachers. When teachers were asked of the benefits and the new learning they gained from the workshops and the entire PD Programme they said they learnt the following as presented in the diagram below:
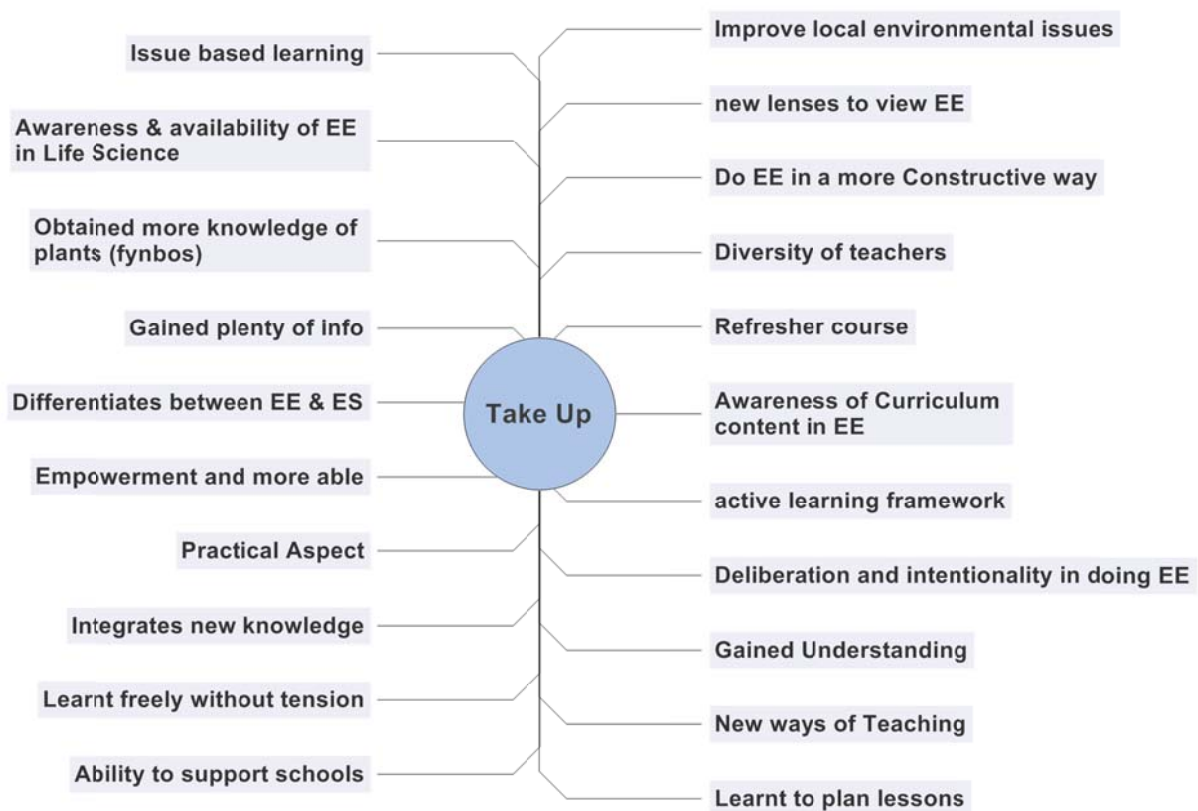


Diagram 4.9: Take—up as described by the teachers

Rose[24] indicates that she learned a lot from the *practical aspect* of the programme-especially where nature was brought into classroom as they learned. She also learned to *integrate new knowledge* from the previous knowledge. She discovered *new ways of teaching* plus new *curriculum content*. She seemed to be filled with so much knowledge, so compacted without proper explanation and distinction of that knowledge. She was able to see a clear difference between what she had learned years back to what she was learning at the PD programme. She could list a number of those things she remembered to have learned without how she learned them. She expresses

> […]am...just what we am… am… we go by diversity we took different pictures into different groups according to …or whatever that we can bring into class, that was quiet interesting, yah, yes, we didn't do ecology, the way is being done today ehe, ehe,ehe……. (not clear) what is municipal population, what is community, it was book work, we didn't go out with the children, am, they have the illegal eco system which they investigate, but nowadays it is more…. Diversities… more clearly into the curriculum. We didn't study anything about…. Even when I was in the university. And what the effect of invader is and …em problems (Rose, SI: 1a:2a).

Pansies[25], on the other hand expressed her take-up in terms of being *more knowledgeable in plants and Fynbos.* She is now able to teach learners environmental studies better than before attending the PDP training. She is able to teach learners things she learned about indigenous plants and pollution. As compared to her initial training which was more theoretical and boring, she preferred the way this specific PD programme did their practical approach where they were able to see plants in their natural setting.

> I did have that training but, you know, I didn't like that part because of the theory in class. At the PDP[26] we were able to see that plants: the alien plants and indigenous plants. It was practical (Pansies, 4a: SI).

She also liked the *collaboration* that was created during their PD programme, as this *motivated her* to continue in the programme. There was also *a diversity of teachers* from various schools which she felt was a positive phenomenon in her learning. She admits that she *gained a lot of information.*

She stressed the fact that she enjoyed the presentation aspect of the workshop and its practicality.

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[24] Pseudo name
[25] Pseudo name
[26] A pseudo name for the specific PD programme that I am evaluating.

> The presentation parts Mam, because they showed us all the plants. They just not presenting class; they take us to the garden and show us the plants. We went to a nature reserve in Muizenburg we saw the Fynbos and alien plants and how they killing the indigenous plants. This PD programme is more practical unlike in University where you study for exams (Pansie, 5a: SI).

She also indicated that at the university where she attended school, learning was stressful during exams, while learning at the PD programme *created more freedom* and allowed her time *to learn without tension*. For her this made learning more interesting.

Pansies express her *new understanding* as compared to her initial Biology understanding that she *gained knowledge and empowerment and felt more able*. Lavender also express that the PD programme *empowered her and trained* her on teacher *leadership skill* in environmental education and they are able to *support other schools* within their community.

Additionally, Lavender indicates *New learning*, because she says that her initial teacher training did not involve such training as this PD programme did; as Environmental Education within the schools bear little training and says that, "emphasis in the schools was more on evolution than environmental education. Cactus, learned from the PD programme to *differentiate between environmental education and Environmental studies*. He says:

> It was my first time that I could see the distinction between Environmental studies and Environmental Education. Environmental studies were more about Ecology, but environmental education involved other things in the surroundings where you live in within the community (Cactus, 2a: FG).

*Lavender's*[27] background as a non-Life Science teacher enabled her to pay more attention to the PD programme from which taught her a lot. She learned about the *availability environmental education in the life science curriculum, the active learning in the community* and *the issue based learning* was more prominent things that she learned. She also gained insight on how teachers view environmental education. She was enabled to see the things that are being done at school, and this gave her *new lenses to view Environmental Education*. She says

> I am not teaching life science, I did not have any concept of curriculum and availability of EE in the syllabus. The Active learning in the community and issue based learning were prominent things that impacted me. Again it also gave me insight on how other teachers see EE. Lack of things being done at schools. Most of the educators see EE as the green environment. Trainers took us out at nature reserve, and one of the teachers asked, "is this Environmental

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[27] Pseudo name

Education...is this bacteria….etc." many teachers have never been to excursion with learners. It also opened my eyes to see the importance to teaching EE and how EE has been neglected (Lavender, 3a: FG).

The PD programme also enabled teachers to see environmental education beyond the green environment. Lavender is not trained as a life science teacher but was able to see the integration of EE into this learning area. She also exposes the fact that the lack of things being done at school could be as a result of lack of knowledge on how to teach EE and how it is integrated into other learning areas. For her this became clearer even as she attended the training in the PDP.

Cactus, expresses his take-up in terms of the practical *technical structure* of how to develop a programme which helped them *to do EE in a more constructive way*. He also showed the researcher the artefacts that were very visible in the environmental education lab that they have developed. Additionally, they gave the researcher the opportunity to visit their garden where they grow Fynbos and vegetables. These vegetables are sold to finance their projects. (There I observed a compost heap that they established, their water reservoir which was located on the school premises as a product of their training and a way for them to create more awareness in sustainability. They also showed me their irrigation scheme that they had developed together/ in partnership with learners as a form of environmental learning. This indicates their efforts and that they went beyond the content they learned, they were able to apply the knowledge) they got to improve their local environmental issues as depicted by the curriculum. Cactus explains further,

> The PDP gave a very technical structure of how to develop a programme this helped us to do environmental education in a more constructive way- and this is evidenced in our lab as you can see. Theoretical framework was very essential and the action projects (Cactus, FGI, 4).

Sisal indicate that he did not learn much from the PD programme except for the Active Learning Framework, reason being that he has a background in EE in his initial teacher training. His learning was minimal not the knowledge aspect but the skills and awareness and his attitude and enthusiasm also increased in teaching EE.

> I say that I didn't actually learn much except for the active learning framework for doing environmental projects. That was the main thing I actually learned from PD programme. A lot of the contents they have covered I actually did in my degree. So it was more like a refreshment course for me. But the conducting of the active learning framework that I found particularly useful for my own teaching practises (Sisal: 2: SI).

He has a science background and most of the content that the PD covered was a repetition for him. On the other hand the Active learning Framework gave him more insight on how to go about teaching EE. It also provided him with guidelines and framework on how to conduct environmental studies

> It wasn't really different. It just provides me with a guideline and a framework for me to conduct an Environmental Study in concept of various themes like creating Enquiring (Unclear) then actually doing something with the project that they've done. So that was for me was different, the framework (Sisal: 3: SI).

Sisal provided a significant mode in the way this PD programme was conducted- a more practical approach - in other words, the PDP was focused not only on knowledge about the environment, but also being in the environment and doing something for the environment. Sisal felt that the PDP would have been more beneficial to those teachers who did not have a science background, because for him it was more of repetition. This implies that he did not benefit much from the PDP as he thought he was already familiar with some of the programme contents Moreover, he expressed that this familiarity with the PDP contents created boredom to him as most of the workshop was a repetition of what he has already done in the previous training. PD programme increase Sisal's awareness of the importance of EE and it's, because he initially thought that EE has not been a big part of the curriculum. Training in EE in this PDP brought about attitude change in Sisal,

> I think it's very important for students' to know about EE because it's going to have an impact on our everyday life. I think when you teach a subject like EE you need to relate it to student's lives and their context. Otherwise it is not... Anything thing that you teach you should try and relate it to their context. EE is very important. There are some threats to your environment and they can cause harm and students need to be aware of that (Sisal, interviews).

*Enjoyed the programme and it was entertaining:* Daisy expresses that the PD programme offered her knowledge. Global warming and sustainable development are among the topics, she gained more information on the workshop topics and general layout of the PDP training. The PD programme played a role of refreshing her knowledge on things that she already knew. Daisy indicated that the PD programme was entertaining and she enjoyed it especially the outdoor practices and her involvement in doing their own projects on sustainable development.

The PD programme mechanisms refreshed the knowledge teachers posses, exposed underutilized knowledge of teachers and enhanced theoretical knowledge and advanced their knowledge into practice. From the project Cyprus learned a different approach to EE as

compared to her initial training. She learned to be more deliberate and intentional about environmental issues. Amongst others she learned to instil practically the idea of sustainability, got more clarity on EE topics; plants diversity and medical aspects of plants and awareness on environmental activism.

> I think, it made some things clearer, especially... If you look at the plants that have a medical sense, how to approach those things. To tell the next person, listen, take only what you need, not more. Don't destroy, look after. And then come back to your school and try to do the same. Don't take too much – take only that you can use. Say the Aloe plant – take one leaf. Why must you take the whole plant you understand? (Cyprus: 3: SI)

Moreover, Cyprus learned to bring across her lessons into her classroom in a better way by engaging the learners. After implementing some of the things she learned at the workshop in her class, she observed a tremendous improvement in her learners' marks and interest in learning the subject. Her learners developed practical attitudes, skills and knowledge on environmental awareness that they cared for their own school physical environment by picking trash. You talk about learners in this text, and then you change it to students. If this is a lecturer please state it, otherwise the consistency in the text is broken.

> What I practised in the class and what I've learned there is that you must involve the child; involve him. You guide so him so that he can guide others. So that you can take that what you've learned in his immediate studies but also out there (Cyprus: 2: SI).

She also taught mentoring students to work cooperatively which she personally practiced at the workshops; a learned technique in teaching. She learned practically to bring learners in touch with the object of learning which was most effective for her.

### 4.1.3.5   : Implementation by teachers

In this section the researcher intends to code data with regards to putting in to use or practice what the teachers leant from the PD programme. Pansies indicate that she is able to use the *knowledge* she gained from the PD *to make* her *classes interesting*. However, she has not been able to do the practical aspect of outdoor teaching with her learners.

> I'm not doing anything like practically…  Now I'm able to explain to the learners even the things that I didn't understand.  I attended a workshop in 2008.  No, in 2009 was able to teach Grade 11.  I had no knowledge in Environmental Studies, but now I feel more able and empowered, now I know more (Pansie, 6, 7).

Additionally, she has been able to *facilitate a project* with her class that enabled them to present in a conference which brought about a positive response and excitement in her learners. Cactus, expressed their implementation of the action project that they have started in rehabilitating the 'Hake beach' which he indicated encompasses the curriculum requirements and is fitting into their classroom schedules and is still on-going. He also gave the researcher copies of the projects that they are involved in with the outreach greening programme where they supply the seeds and plants for the neighbouring schools or crop propagation. He also added that their school is an Eco- school.

> We have started a hake dune[28] project, where we rehabilitate the 'the Hake beach'[29]. We are doing this with syllabus in mind. We have also been doing some river project that is still on….here is copies of the project…We are also involved in the outreach greening programme, where we supply the seeds and plants for them and we also take it to neighbouring schools for crop propagation by the way this school is an eco-school (Cactus, 4-5:FG).

Cactus adds, "We bought *a container for recycling*, we also *do irrigation*, we bought a tank also so that we can store water, and we have our own compost heap that supplies our vegetable garden…" (Cactus, 6: FGI). Daisy and Eucalyptus have developed *a resource garden* that they use in teaching about diversity in plants, although she says that they need more plants this is an indicator of take-up of the PD.

Cyprus was able to create awareness and knowledge on the environmental diversity and environmental issues within her class and school environment. She integrated the ecosystem into her lesson planning. However, she noted that the implementation in the school was actually cumbersome because of the big classes.

The noise levels in the school are very high and it hinders collaboration but the training helped her to cope with these difficulties. She admits that she is doing 80% of what she learned at the workshops.

> I think I'm doing 80% what I've learned there. Therefore even started a water wise garden and taking the kids. Plants that's really help you with your health. That I do with my Grade 10's. They physically go and replant (Cyprus: 4: SI).

She explains that she educated the learners about the layout of the garden, then made the garden and involved the learners to use the garden for research and outdoor lessons. Sisal, was able to establish a project as an implementation to what he learned at the PD programme,

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[28] Pseudo name
[29] Pseudo name

he executed together with his learners a project on water masses using the Active learning Framework. And that from this training the school have began to take EE seriously.

> This year, yes. I took my learners to water masses. They compare two water masses. They did a scientific investigation of the area, after these projects the learners made a poster of their project (Sisal, 17: SI).

The PD project actually enhanced Sisal's interest and focus in his Research Masters.

Eucalyptus and Daisy were able to plan a project for their class but they were not able to carry it out. I asked to them if I could see their project plan for analysis but this was not made available. The tried several times to search for the project in their memory stick- storage device but they were not able to retrieve this document. This however, limited me in observing some of what they were able to apply in their planning. I requested that they send it by email but another excuse was that their e-email is "not up and running" (Daisy, FGI). I had wanted this programme because it is one of those that they presented for the action projects. They indicated this programme was not implemented because they said that time constrained their practice. They were also supposed to be lead teachers but according to them this was not a reality. Diagram 4-10 provides a visual summary of aspects of implementation as explained by the teachers.
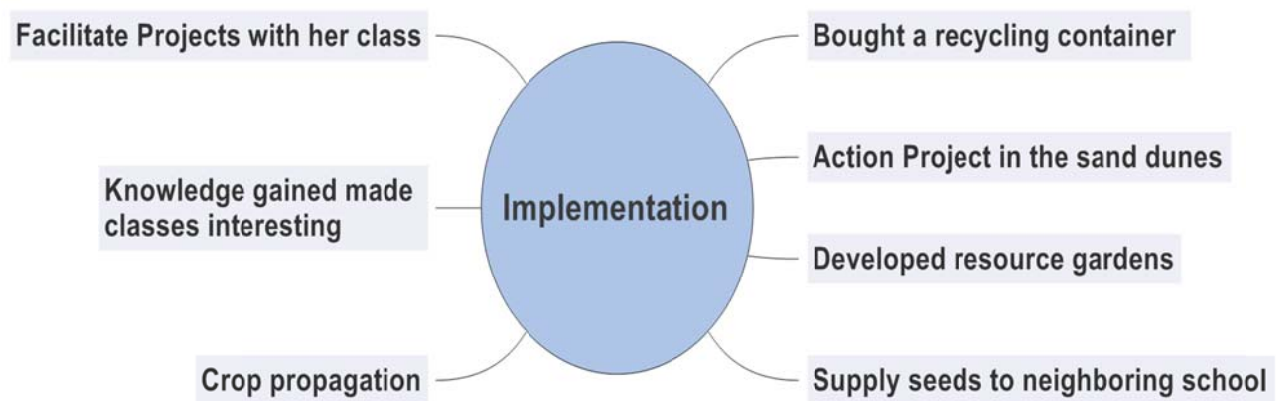


Diagram 4.10: Implementation of teachers.

#### 4.1.3.6 Support:

Lavender and Cactus admits that they received some sort of support from a from the PD programme which was a once off support. Cactus indicates that this support came from a departmental official from another district not their own district as their departmental official

did not attend any of the workshops. But the other official has a passion for environmental education. Daisy, requested support in implementation of the projects and asked if the PD programme officials can be part of that support.

She is ready and willing to work along with the project managers as the departmental officials have not been able to give them any support. Eucalyptus on the other hand requests for support on how she can integrate what she learned at the PD into teaching maths, as she finds it very difficult to relate the two.

> It doesn't just stop at Life Sciences. If I'm thinking now, certain subjects leans itself to Life Sciences, you can do that all the time, but if I think about Maths, how can you bring environmental education into Maths? I can think of few things but not always (Eucalyptus, page 13).

Sisal asks for more support, and collaborations in the school, he asks that the schools be visited so that they can locate context of the schools in that they are involved with. He adds that none of the trainers have ever been into his school for any kind of support or observation.

He feels that assumptions were made that participants should be on the right truck.

> I think there should be more support. I think they should actually come to the schools more often to see how the Environmental Projects are going. I mean, it was just Achieng. For her to travel to every school can be difficult… No. Not for not to check up. I think she felt that we are on the right track with the projects. Before we present our projects we were only three schools there and we started with 15 schools (Sisal, 22: SI).

*Reflection*: Since Daisy is teaching Maths and was selected for this training, she then is calling for support in interacting what she learned into the learning area that she teaches. This has a lot of implications. How can a Curriculum Advisor leave his district without rendering any support and move to assist a school in another district?

### 4.1.3.7  Continuity of the programme:

Teachers indicated that the PD programme should continue; but that meaningful support and continuation of the programmes should be allocated within the three years and therefore be more fruitful. Diagram 4-11 is a visual presentation of data that emerged as continuity of the programme. This theme emerged when teachers were asked whether they thought that the programme should continue and if so were asked to suggest things they thought would help the programme to remain sustainable and show improvement.

**Increase contact sessions evenly**

**Distribute Contact sessions evenly**

**Reduce a given content**

**Create more awareness of EE in Life science**

**Follow up Workshops**

**Needs more meaningful Support**

**The 3 year period needs to be looked into**

**Increase Contact sessions through the year**

**Continuity of Program**

**Follows up workshop**

**Reduce a given content**

**Distribute contact sessions evenly**

Diagram 4.11: Continuity / sustainable way of the programme - from teachers' perspectives

They suggest that for continuity to be sustainable, the programme should have identified projects, firstly during the workshop so that while the workshop is on teachers can be able to plan for their project while still in contact with the PD officials. This is because, in the PD they underwent; teachers were only told about projects during the end of the workshops and many did not have a planned project and lost contact with the three year period of implementation of the projects.

> You know what I also like. We should have started with the implementation earlier; and identifying our projects earlier. We had workshops, but at the end there was focus around, you know, you should identify your project. I think that should have been done earlier. At that stage when everybody started their projects, the workshops were finished. There were a lot of schools that didn't do their projects just because the workshops were finished and there is nobody checking up on you. Cactus (10a-11a)

For Cactus, the amount of information given in six contact sessions was been too much to consume, especially in such a short period of time. Since the workshops are planned to run for a year they had to been evenly distributed to allow teachers to absorb the contents of new knowledge. Hence the expansion of these workshop contents also needs to be looked into. "I would have liked more contact sessions. We only had six. They must look at the duration of the training" (Cactus, FG: 11b).

Teachers would love that in the future, more follow up workshops be organised for them to share and be updated on the projects' development. More emphasis should be put on helping

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teachers identify issues that would help them in their projects and curriculum alignment. Cactus observes that grade 11 curriculums have a lot of EE outcomes that most teachers are not aware of. He is enlightened on this due to his background knowledge and involvement in Lead teachership. He is already enlightened by this, because he has background knowledge and involvement in Lead teachership.

> We would love to have more follow up workshops for people to share and keep up to date with the developments… lines at PD programme are always open. Grade 11 school curriculums; there are lots of EE outcomes. More emphasis should be put on how to identify the issues that would help the teachers or stakeholders to identify […] (Cactus, 12: FG)

Teacher feels that this programme should continue and asks that the PD programme should be taken further.

> I think the PD programme shouldn't have just stopped there; they should implement a course that's going on and maybe take it to another level. I don't know if they had a similar course going for some people. I know, we were supposed to sleep under the mountain in the huts. I don't know what happened to that. But I think they must have more something like that; out of the school away from our work. I didn't do it in my school time – I did it in my spare time (Cyprus: 6: SI).

Sisal suggests that there is a need for incentives in order to motivate teachers to attend and see the importance of the PD programme. He also admits that PD programmes like this one should continue but he recommends that they should look at the individual participant that will actually benefit from the PD programme; re-looking /by re-evaluating their criteria of selection.

### 4.1.3.8    Partnership

Partnership in this section shows how the schools collaborated with different organisations to enable them to run their various projects, i.e. financially, educationally, and materially and resource wise. Lavender, expresses that they belong to a group called 'eco-schools' which he says supports their programme. The partnership in this school seems to be driven by commitment and passion which allow environmental education to thrive, says Lavender, "first it is our passion… (They looked at each other and nodded their heads) and the principal also supports us so much, the eco-school also supports this project" (Lavender, FG: 5); Cactus adds that, mining companies also helps fund their sand dunes projects.

### 4.1.3.9 Criteria of selection: Teachers perspective

Teachers indicated lack of awareness of the criteria used to select them for the PD programme. Most of them were just informed that they should attend the programme. "So we didn't know what criteria they used to select the teachers" (Lavender, FG: 12a). Eucalyptus, declares that she had no background or form of training in teaching Life Science, yet she was a participant in the PD programme; she has been more of a language teacher (Eucalyptus 2a). Daisy is also a maths teacher who finds the training irrelevant to her learning area, and wonders how she would apply what she learned in mathematics. Lavender on the other hand has no background training in Life Science. Even though the programme target was aimed at training Life Science teachers, the data reveals that not all the teachers were Life Science teachers. *Reflection*: Meaning either the education department officials did not use the Programme's criteria or the programme did not stipulate that demarcations of the selection criteria. *Reflection:* clear cut of selection criteria.

### 4.1.3.10 Challenges of Implementation

Pansies acknowledge that the presentations made by the PDP are great, useful, insightful and interesting but implementation becomes almost impossible due to the *tight syllabus* that does not give room for EE, while the Department of Education requires them to finish their syllabus on time. Diagram 4-12 visually presents these challenges.
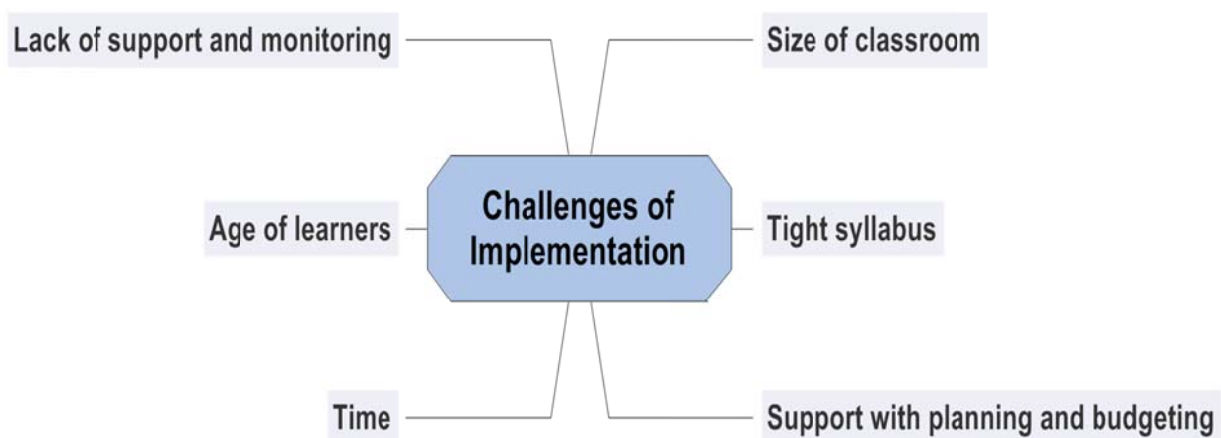


Diagram 4.12: Challenges teachers faced during implementation

*Reflection*: Pansies had not been able to see the integration of environmental education into Life Sciences hence a "tight syllabus". This also suggests that the overall message of the PD

programme did not succeed in the ability to train the teachers to enable them to establish integration as part of the syllabus and can be practiced in the given school time. The programme was unsuccessful in training this teacher. Lavender on the other hand saw integration of EE in the curriculum as a take-up of the PDP processes and she is able to implement environmental learning very well into her time schedule now.

The *size of the classroom and the age of the children*; "em… (thinking of what to say) one factor I think which hinders to do this, the number of kids, age groups" (Rose, SI: 3). This prompts the lack of curriculum knowledge and innovative activities from the teachers' side that would suit learners' age groups. Another factor that hinders implementation is lack of *support and process monitoring* from the stakeholders concerned in order to render teachers the needed guidance and support. Rose academy indicates that they lacked this support. The schools *needs support in planning*, budgeting and putting up resources to enhance their implementation and practice of projects in order to realise the set objectives of the projects they had set up.

> maybe… a specific activity maybe, I don't know...may be like for example helping plan the budgeting, helping putting up a resource in the school that will help with the process…with a resource, yah yah…The internet. Of course. Em… (Thinking of what to say) interactive facts books. But not internet. I think, em … Biology, the field is so wide that it's very necessary for information, tell the people to go to the library. Not everybody has internet, but, people do not have that information in the libraries.

The schools also indicated lack of interactive resources for instance internet and interactive fact books to support information on teaching Biology because the subject field is widespread. *Time* is also a factor that affects a teacher's involvement in implementation alongside the workload that awaits them.

> I want to come back to one very important fact is time. He is Mr. Z[30]; he really doesn't have time to go out on Saturdays. Every Saturday it is rugby. Time is actually the problem. The children who take part in this are also those taking part in more than one sport (Rose, SI[31]: 7c).

Time for rugby for Rose is the same time she would have used to implement environmental education projects as there were no other time, and the school focuses mostly on sports. She adds that, the children involved in rugby are the same children that she needed to use during

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[30] Pseudo name
[31]  SI- Semi-structured Interviews.

her implementation and for her this was just difficult. She is also not ready for any implementation, as she does not have the time. She categorically says,

> Every Saturday it is rugby. Time is actually the problem. The children who take part in this are also those taking part in more than one sport…I don't really know what… I don't want because I don't have the time … the curriculum is very tight... We don't have time. You need to do it in the afternoon […] (Rose, SI:8a…9a)

She also notices that the curriculum is very tight and has no time for implementation for EE. This signifies teachers' lack of awareness of the integration that exist in the curriculum. Sisal also notes that time is a constraint in practicing EE in the schools.

### 4.1.3.11 Attendance:

Rose did not attend the workshops regularly and had to get a substitute teacher to attend at one point. Sisal indicates that when they began the project there were fifteen schools in the project but along the way many dropped out, a point that he makes clear when he says, "Before we present our projects we were only three schools there and we started with fifteen schools"(Sisal, 22-23).

### 4.1.3.12 The workshop:

Rose, expresses that the resources that she experienced in the training at the workshop were far much different from what she had during her own training and for her this created an impact in her learning. She acquired more knowledge of how to bring diversity in class as compared to her initial training. The teacher seems to have forgotten how certain things were done at the workshop when she says that she cannot remember specific things she learned at the workshop as it has been a while since she attended the training.

Eucalyptus comments on the PD programme's teaching style and says that she/he felt that the notes and the power points would have been given to them and then more time to be given to the practical aspect of the programme. They preferred outdoor learning because Daisy indicates that she loved the garden lessons.

> A lot of the information given sometimes is given to us in the form of a lecture where they, like, give us the notes, and then they also explain the notes on a screen. Sometimes it just felt we could have done that at home (Eucalyptus, 16:FG).

There was an expression of lack of satisfaction with some of the resources that the PD programme used. Expressions like this explains it

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> They sent us to different... We went to 'Kirst' on our own. Then we went to a trip to Wolfgat. There were supposed to be different species. (Laughing.) Then they took us to another reserve but there was hardly anything to see. (Laughing.) That was an anti-climax. We were struggling to find... (Eucalyptus, 16: FGI)

*Reflection:* it seems as though the trainers had no prerequisite visit to the teaching sites before taking teachers to this site or they failed to be creative and innovative to meet up the contextual challenges that faced them at the site. Sisal commends the PD programme on in terms of its resource management. He also compares this PD programme to the ones he has attended to be one to the best. He recommends that the PDP officials should be able to provide worksheets and teaching resources, learning resources for teachers to use in schools.

> They should go like special ways... They must focus more on how a certain aspect should be covered and provide the resources. If I do global warming then they should obviously give the background and also resources that I can use in the classroom like electronic resources. There's the other project I'm involved with is a (unclear) and they provide equipment to the school. They provide worksheets and exercises that learners can do. They should look at something similar to that (Sisal: 20-21: SI).

### 4.1.3.13   Lead Teachers

Here the researcher will describe the leadership responsibilities that the teachers took in order to train other teachers who did not attend the workshop as to fulfil one of the PD programme objectives. Here the research will indicate those who did attempt leadership, those who actually lead and those who did not.

> Rose did attempt to cascade the programme in an informal way. They did talk about their experiences. "Yes, yes, we do talk…it's informal" (7a: SI). She also points out that while she did this she faced opposition from her fellow teachers who did not want anything external and they were not interested even though they were life science teachers. She says, "The one is not interested at all "(7c).

Lavender and Cactus on the other hand were able to carry out their leadership roles beyond their own schools to schools within their neighbouring community.

> The PD programme project empowered us and trained us to train other teachers as well as in other schools. We are regarded as lead teachers in environmental education. We make use of our school to conduct training (Cactus, FGI: 7).

Sisal reveals that nothing has happened so far as being a lead teacher is concerned. He says that he was to become a lead teacher but has not done anything because he heard nothing from the PD project. He says "No, nothing. I was supposed to become a lead teacher and

guide other teachers. I haven't heard anything from the PDP" (Sisal: 24: SI). However, he would have shared with his other four teachers, but that they have different projects with their learners and he does do his with his learners as well.

*Reflection:* the teachers expressed the need to have a closer relationship with PD programme officials so that they can engage with the schools more often to ensure that the teachers and students are in equilibrium in the implementation of the workshop objectives.

### 4.1.3.14 How the Nature of school Management and culture influences implementation:

School culture and management has a significant influence on how environmental education in would thrive in a given school. One school is a rather small school and does not have a subject head of department meaning that the school is understaffed. It has a population of about 400 students, the classes are overcrowded. The teacher explains that the individual class population where she teaches Life Science and the space I observed was too small to contain 60 learners at a sitting yet that is where she practices environmental education. I wondered how environmental education can be taught in such an environment. The teacher explained in the extract below

> We have 400 and something for the school and then for Life Sciences …we have 4 Grade 11 and two Grade 12's and two Grade 10…In Grade 12 we have 60…No, all the Grade 12's. Grade 11 we have 28 and 25. Grade 12 we have 60 students and 50 something (Pansies 2a…15)

On the other hand, however, effective school management and supportive leadership can enhance teaching, implementation and take up in environmental processes. Cactus (a teacher), expresses that the continuous support they get from the school principal has been one of the causes of their success in EE projects. It seems like a stable school because the relationship of the principal and the teachers is mutual and allows a favourable environment for environmental learning.

## 4.1.3.14.1    Nature of the School Timetable/Time Schedule

Teachers run a seven day cycle lessons. This indicates how the teacher's day looks like. The workload as expressed by Pansies is enormous and affects how she would integrate Environmental Education into Life Science she says requires a lot of time and planning. However for Lavender and Cactus were able to do their projects with grade ten, eleven, and twelve within the seven day cycle of lessons of 55 minutes. Lavender expresses

> We do these projects with grade ten, eleven, and twelve Life Science teachers. And we do this within our seven days cycle of lessons of fifty-five minutes. Otherwise, it involves a lot of determination, planning, passion. Otherwise I teach maths, Maths literacy and Natural science and in this for example I talk about birds in the Hake area and the like….The programmes are more structured; learners participate, through report keeping. We are also forming partnerships and we are more aware of the PD programme… opened up network systems for us (Lavender, FGI: 6-7).

### 4.1.3.15    Teacher's attitudes towards Environmental Education:

The manner in which the teacher responded to the questions regarding this projects implementation instigates negative attitude towards Environmental Education. Even answering the interview questions signalled a waste of time for her. She sounds too busy and has no time to discuss the matter further as she does not sound interested. The researcher established that the respondent age and period of her initial training contributes to her lack of interest and accelerates her negative attitude towards EE. Her tone of response also suggested a waste of time and negative attitude. Her responses were too short and incomplete which connotes lack of interest. She also mentioned that she travels a lot and has no time for action projects. She says, "I don't really know what. I don't want because I don't have the time" (Rose, SI: 9)

Pansies, on the other hand expressed an attitude of positive change. For her the PD programme changed her attitude positively and has gained more knowledge and developed interest in teaching environmental studies. Daisy, demonstrates a positive attitude in her willingness for more support in environmental education. She is very thankful that she attended the PD training as this opened a world of Life Science and especially the integration of EE into Life Science that she could see more clearly. She is also positive in sense that she was able to put in practice what she learned as she has no Life Science background.

Cyprus has a positive attitude towards the PD training.  She says that the training was a motivation for her. It brought a renewal and growth in her career which she was at the verge

of terminating through resignation. It made the Cyprus feel better about herself, her growth and ability to teach better. She is currently more motivated towards being an environmental activist and educator.

> I think I do a lot of things differently.  Just by the way, before I started the course my resignation form was in.  There was no future anymore. My form was given in.  It was the same old stuff and life of teaching is just one boring, you know?  Then they said, what made me decide to … I ask the principal give me another chance; give that forms back to me.  I will rethink the whole idea I will uplift myself.  He gave me the forms and said:  if you want to uplift yourself, fill in this form and go on this course.  I did it with many other courses.  It helps and it makes you feel better about yourself.  You are motivated also.  When I left the course it was actually a pity.  But like I say, I use the garden still for my learners as a excursion because I think very little of our kids really go in to the garden, know plants, do any planting at home, know about bio diversity, know about recycle or reuse and stuff like that (Cyprus:5-6: SI).

Sisal notes that in his own teaching practice, EE is not taken seriously, it is not considered as the heart of curriculum;

> Well, in my own teaching practises we don't take Environmental Education serious.  I mean you focus more on the heart and so on.  When we come to Environmental Education, then we normally leave it for the last.  Then it is just a worksheet the learners work out.  There is no really taking them in to the field.  That is due to time Constraints and things like that (SI).

But now he is aware that EE involves the field work in the environment and that it is integrated in life science.

### 4.1.3.16    Teachers' awareness of the importance of the PD Programme

In this theme, I will describe what came out from the respondents to describe their knowledge on the importance of a PDP like this one that they were part of. Cactus reveals his awareness of the curriculum requirements for the grade eleven syllabi and indicates the importance, vitality and the impact this PD programme will have on their training. The PD programme's course alignment to the National Curriculum statement's requirements for schools was also visible for him. He puts it, "yes, the grade eleven syllabi requires it. So we saw it as an opportunity to develop in such a programme" (Cactus, FGI: 1a). The PDP was relevant and needed by most of the teachers that attended the training secessions.

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### 4.1.3.17 'Nothing new'

Nothing new is a theme that struck my attention, not only because of its recurrence but because of how teachers would express their attendance of the training and utter, "Nothing New".

Cactus, when asked about what he had learned at the PD programme that was new or different from his initial teacher training says, "… nothing new" because he studied a similar course at the university. Pansies, on the other hand, was asked the same question and she says "there is no difference".

It bewildered me as a researcher that educators can actually attend a session of training without learning anything! This was a fascinating theme to convey. For the fact that educators learnt nothing is new learning in itself.

### 4.1.3.18 Teachers' disappointments:

The teachers felt disappointed at the end of the programme. Certain promises were made by the PD officials but were not fulfilled.

> We were just very disappointed in the end. They made such an enormous amount of promises to us and nothing happened. We are quite sad about that because we feel that we can easily visit the garden as was promised to us, we could have enrich us but nothing happened (Daisy,17:FG)

Eucalyptus adds the following,

> [...] the other thing that I was disappointed in that, we had presentations that we had to deliver. And based on those presentations, one person was chosen to go overseas to go to Canada. One person from our group was selected. We all agree it should be that person. That happened at the end of the year; it was suppose to carry on for three years. The person went overseas but nobody had the decency to tell us that they chose that person. Nobody told us they chose him to go. Nobody even, there was no feedback after they came from Canada as to what happened and what was the good points... Afterwards we never heard of him again. That was bad. If they should tell us anything now and tell us to sit in a workshop just because of how that ended, that was so disappointing. We never heard of them anything again. You the first person that we see. That is sad. We put in effort; we put in a whole year of our time, every Saturday, just to be (Eucalyptus: 17: FGI).

Teachers felt that the programme ended with the workshops because nothing active has taken place from the time workshops ended. They conveyed the message that the programme seemed to have been a year thing and a once off thing instead of the prescribed 3 years.

You see that is only the presentation that we have done for... Different people did different things. It's only our presentation; so from there they chose who is going to Canada. That was our presentation. There is nothing else. She might still have something at the back… But we only did that for half a year. (Eucalyptus, 22:FG)

Eucalyptus felt left out in the promises that were made, certificates were promised to be given to the teachers and this did not take place. The teachers felt left alone without further communication. They did not have any feedback sessions on their projects as well. "Nice people that work for you the whole year. They said they will give certificates to show that we were part of that... We just feel like left alone" (Eucalyptus, 23: FGI).

This chapter has presented analysed data according to themes that emerged from the data. The themes coding process was partially illustrated, the emerging themes were named, and defined. The themes were then interpreted, this whole process entailed data analysis.

### 4.2   **Summary**

The activities were planned to start in 2008 and culminate in 2010. After a selection process, meetings were held with principals and educators of respective schools to outline the details of the project and encouraged to voluntary participation. The schools were asked to commit to the project for three years. The project as planned was to be undertaken in a series of workshops followed by the action projects. Learners were expected to participate and complete action projects. In the plan the project included a built-in Assessment and evaluation process.

This programme was intended to benefit a core of leading teachers in the FET band that will have capacity to implement action projects within the curriculum, they were to become cluster co-coordinators, develop resource pack to enhance teaching and learning, educators were expected to present their work and research at conferences and excursions for learners and educators as incentives. They also intended that this programme would trigger a research master project through collaboration with Stellenbosch University. They also envisioned that teachers were to be able to participate in a curriculum Development process, learn on how to implement projects. Learners were to become familiar with their own areas, enjoy the field work apart from chalk and talk approach. Transportation and other resources were sponsored.

The project was in its final year in 2010. Most of the schools are no longer part of this process. Attempts were made to contact the schools but without success. Four schools out of the initial number trained, are actively involved and one of the schools was approached to

ascertain their level of commitment. The projects were reported to have been on in the 2010. The support never took place. The programme had to cater for growing number of teachers who were losing interest. It was decided that the development of teachers would be scaffold. In future the educators will work on projects as the programme unfolds and not only at the end of a process. Education department officials were partners in this programme that provided support and monitoring system (data from interviews, and PDP documents).

In the next chapter the researcher intends to discuss data based on this analysis.

# Chapter 5
# Data Discussion and Interpretation

## 5.1  Introduction

In the previous chapter data was presented and analysed according to the themes that emerged from data guided by the main research question and the two sub questions. At this level I want to interpret my understanding so far of how the data analysed from the respondents' point of view is addressing my research questions, in order for a formative evaluation of this PD programme.

Kelly (2006, p.350) argue explicitly that a good research project should include understanding of subjective experience and provide an interpretation of developing good interpretive accounts by applying a standard interpretive processes as playing the tension between insider and interloper complimenting context and theory, amalgamating the reading of parts of the text into a lucid entirety of perceptual and cognitive processes of concentration, unloading and connecting  "A good interpretive account shows what the world is like from a particular perspective, while at the same time drawing attention to its status as a perspective" (Kelly 2006, p.360).

Just before I interpret, I want to take us back to foundations of this research. First, my research topic is "*An Evaluation of a Professional Development Programme in Environmental Education*"- indicating that my unit of analysis, discussion and interpretation is *the programme;* in other words the evaluand of this research is *the programme*. A programme consists of a plan documented to show the organizational intentions and plan for the professional development of teachers in environmental education and also of actions and activities consistent with the information documented in the plan in order to carry out the professional development of teachers that they envisioned as analysed in Chapter four (Owen and Rogers, 1999, p.24). These activities in the case of this research were carried out by the various stakeholders that took part in ensuring that the programme was carried out to meet the intentions of the PDP as planned.

Fundamentaly, a carefully developed set of evaluation questions gives structure to the evaluation, leads to appropriate and thoughtful planning, and serves as a basis for essential discussions about who is interested in the answers and how they will be used. Construing such questions and planning how to answer them is the primary way in which an evaluation is tailored to the unique circumstances associated with each programme that comes under

scrutiny. Evaluation questions are pivotal to evaluation planning for this reason the research questions paused by this research play a fundamental role and act as an instrument of validity and focal point of the evaluation objectives (Rossi, Lipsey & Freeman, 2004, p.53). The instrument therefore, as used in this research is the questions (one main and two subs) as shown below:

Main question:

- *How has teachers' training in Environmental Education enabled professional development of teachers in EE?*

Sub questions:

- To what extent has the professional development process at the PDP enabled implementation?
- How effective has the Professional Development Programme been with regard to take-up?

In the same vein, validity in research is described to be seen when an instrument is measuring what it is supposed to measure. To keep to this, therefore, this research is a formative evaluation with the purpose and aim to improve the sustainability of this programme; I interpret and discuss the programme theory and the activities of the stakeholders and how these address my research questions. The emphasis therefore is: How has the documented plan enabled implementation, take-up and the extent of Professional development of teachers (reference to the research question above). Moreover, I will interpret data in three distinct activities: The activities of the professional development programme officials; the activities of the department of education officials; and the activities of the teachers with regard to my research instrument and the data presented and analysed in chapter four.

In the evaluation and interpretation of this programme I incorporated general indicators, standards and criteria for effective professional development programmes as described in literature in chapter 2 and chapter 3 (Owen, 1999, p.28; Rossi, Lipsey and Freeman, 2004). In addition to this, the specific Programme objectives, aims and goals of this specific professional development programme will also be used for interpreting the data. This data was gleaned from the analysis as projected by the data of the various stakeholders in chapter. The context of the programme plays a very vital role in this interpretation (Rossi et al., 2004, pp.133-135).

Many evaluation scholars struggle with the fact whether a programme evaluation should have some sort of standard or indicators to make judgement of the evaluation outcomes. These ideas sounded right when I read their explanations of either programme logic, logic of evaluation, or evaluation indicators or evaluation standards (Owen et al., 1996, p.5; Craft, 1996, p.61). But I did ask crucial questions on who is to set standards? As an evaluator of an already existing programme, who sets the values of a programme? I am left to ask a lot of questions in trying to judge the worth of this programme. If I am to work on programme improvement, then I agree with Rossi et al. when they say that programme objectives and intended outcomes actually seem to sets standards in themselves in which a programme evaluation can begin to work. In this programme, the conceptualization of the programme objectives and goals aided the way in which this programme is interpreted and evaluated (2004).

## 5.2 Interpretation of data: What were they able to achieve?

From the perspectives of the Professional Development Programme officials, I would like to look at those activities that enabled professional development, and implementation and how effective the processes that the PDP officials engaged in facilitated and necessitated take-up. I will also look at significant activities of education department officials and teachers as participants and interpret their roles as contributing factors to take-up, implementation and enhancer of professional development. These activities will be interpreted in line with the research questions, the PD objectives, and the data as analysed in chapter 4. This will be able to ascertain what the PDP was able to achieve. In this interpretation, data will be clustered differently from the way they appear thematically in chapter four. What I did was to pick a compound theme that is inclusive of the main themes that I considered to be crucial to the improvement of this programme. The interpretation is also integrated in a way that most of the themes do not appear as projected in the analysis. Coherence is therefore achieved in the discussion of the main issues I regard vital for Improvement.

## 5.2.1 Interpretation of Activities of PDP Officials

At this point I interpreted data as was analyzed in chapter three with regards to the roles that was played by the PD officials towards achievement of programme objectives. I also condensed the data in this section using Rossi's et al. Epistemology (chapter 3) of programme evaluation. At this level various themes that emerged are further reduced into a compact interpretation, reflecting the main components towards programme improvement. This was interpreted in the context of relevant literature in chapter 2 that addressed issues in

professional development, Environmental education and how programmes generally are run. Moreover, the literature on evaluation and analysis in chapter 3 also played an important role in interpreting data from the PD officials' perspective. The map, or path for interpretive evaluation is described in diagram 3.2 the design. 5.2.1.1 Interpreting the development of Programme Theory

Programme theory refers to the designed concept goals and objectives that an organization intends to effectively implement. A programme theory is the conceptualization of the desired programme aims and objectives. This study looked at the programme's objectives and the extent to which each of those were achieved (Rossi, Lipsey and Freeman, 2004, p.135). The programme theory of this PDP was generated from the interviews and programme documents.

A programme theory explains why programme does what it does and provides the rationale for expecting that doing so will achieve the desired results. There are many poorly designed poor social programmes with faults that reflect deficiencies in their underlying conceptions on how desired benefits would be obtained (Rossi Lipsey & Freeman, 2004, p.134).

In the same vein, the PD officials had as their responsibility formulating the programme theory. In developing the theory of this PDP, the programme officials formed the engine of how this programme was to be formulated and implemented. To achieve this they looked back on how the previous curriculum that was used in schools was operated and how teachers were trained. They gleaned from this experience the knowledge that they incorporated in developing the theory – the documented plan on how this programme was to run. That is to say that in formulating programme theory they went back to reflect on former ways in which the curriculum was operated and felt that this reflection would lead them into new ways of doing things. This extract from data explains it,

> I think just one thing, just backtracking even further was that the dramatic change there was to the school curriculum and many of our teachers were trained under the old system of rote learning and everything was in the text book. And Learning Outcome which appears in your Natural Sciences, Natural Science, Social Science etc. which is linking science, society and the environment which is a call to skills, not just knowledge. Those were new concepts in the new curriculum and particularly when this FET programme was implemented that was the time at which the new curriculum was phasing in to the FET curriculum. (Page 5 of Transcription – FGI- Management perspective)

The PDP Officials experimented separately to be able to reach a consensus to verify that teachers were able to work with the curriculum documents. Betty recalls when she said

> I remember when we started our first batches of workshops and exposed the teachers to the curriculum documents statements they were lost; it was as if they'd never use this documents in their entire life. We've seen that grown now, so that now when we give them documents, they go o yes, o yes, o yes (FGI: page 6.)

From this experience, they learned and began to do things differently. This also led them to begin to,

> [… ]deliver a 3 hour programme absolutely derived from the curriculum. You might get educators making comment like: It would be nice if this link to the curriculum. And we looked at this comment and think good grieve! Where now almost every programme that goes out in that block, the educator is able to say: I can apply this in my Life Orientation, Natural science, and actually list the actual outcome that they are going to actually use this outing towards. So I think there's been a general increase in the teachers' comfort level with the new curriculum (FGI: 7)

They learned from these experiences which then informed the way in which they planned their workshops.

> […] we've been doing teacher professional development programme and the process that we followed was the teachers would come for workshops, we would build their knowledge and to a certain extent their skills. They could then use the curriculum documents to create a lesson or an activity. What we tried to do was to get them to link what they've learned to the local context back at school… (Achieng: pg 1: focused group interviews)

Like in the NEEP project discussed in chapter 2, The *integration of NCS(R-9)* and the NEEP-GET project arose at time when South Africa was experiencing change this integration consequentially affected the content for teacher development projects that they needed to employ. I see similar lenses in which the PD mirrored their programme theory. The PDP officials felt this was the way to go. They were also advantaged by their background of having been teachers,

> Maybe just to qualify that, we were both high school teachers and so we don't presume especially since we are not in the class room, it help us and gives us some credibility with the educators that we just not coming from the bio diversity background and with unrealistic expectations of what educators could do in the class room. I think that does help in some ways that we know the challenges of being in the class room and finding time. I think it goes a long way with the educators actually. I think it does help us (FGI: page 11).

The PDP officials saw teachers as people who needed to be *built up in knowledge and skills to a certain extent* which was not described (reference to; Achieng: focus group interview). This implies that teachers were 'blocks that were disintegrated and needed to be cemented' and built up in knowledge and skills. Again I see the theory used here as *a defect model* that

Reddy, describes as "… need development because they lack the necessary skills to teach successfully" (Reddy, 2008, p.140). This programme is *prescriptive and reduces teachers' choices,* because the workshop topics were already decided by the PDP officials and no consultation with teachers as participants was made to diagnose their need. Besides, there were only ten Teachers from ten schools who were envisioned to be involved, a manageable number that could have contributed to the programme design.

> If Theory is faulty, the intervention will fail no matter how elegantly it is conceived or how well it is implemented. An evaluation of programme theory focuses on questions relating to the way the programme is conceptualized and designed. This process involves, describing the programme theory in explicit and detailed form and the various approaches used to examine how reasonable, feasible, ethical and otherwise it is appropriate… (Rossi, Lipsey & Freeman., 2004, p.55, citing Chen, 1990; Weiss, 1972).

This PDP model seems to be what Reddy (2004) describes as a delivery or empty vessel model as teachers seemed to be empty vessels that had no contribution to the PDP process but merely passive receivers. This view assumes that the PDP had all the knowledge and skills which they aimed to transfer to teachers. The PDP officials rather than the teachers themselves determined how teachers were to behave in classrooms after the training. Moreover, the approach assumes that "one size fits all" (Reddy, 2004, p.140).

According to the data most teachers described the training as full of information; some said they learned nothing new, while others said they learned so much that they could not remember all the information; this informs the kind of theory that underpinned the design of this PD programme. This programme seemed not to have taken into consideration the specific needs of the teachers they intended to train. The background of teachers showed that, some already had post graduate knowledge in environmental education, others were either maths or language or science teachers; some were on the verge of retiring; others were resigning; all these facts had a lot of implications for the kind of programme that would suit the group of teachers they had chosen. Some teachers, however, found this programme boring and a repetition of what they already knew, yet others found it very interesting and equipping. I think that taking into account these diverse needs of teachers would have informed the theory in a better way.

In view of the NEEP project that was used for professional development of teachers in EE, as discussed earlier in chapter two, this programme need to glean from their notions and ideologies that see teachers as reflective practitioners, that permit teachers occasions where they can examine, evaluate and question values and pedagogies that they are trained to

practice.  It also facilitated teachers to think critically on their own professional development. This nullifies the view of teachers as technicians or passive receivers of knowledge (Janse Van Rensburg and Lotz Sisitka, 2002).

The PDP can also glean from the NEEP project as reviewed in Chapter 2 that the project also developed frameworks for teacher education that were anchored on critical and social constructionist perspectives that buttresses on process and open-endedness in professional development activities. This process was set collaboratively with teachers as learners and room was given for relevant learning guided by context and for relevant learning to emerging from the process.

Another important aspect gleaned from the NEEP project (Janse Van Rensburg & Lotz Sisitka, 2002, p.41) and the case studies in Greece (Papadimitrou, 1995, pp195-212) indicate a sense of *Work together work away*: teachers were clustered and these clusters comprised meetings and study tours, in which the groups 'worked together' interspersed with periods in which pairs or individuals were to work away in the classroom context or on homework activities. These activities are said to have encouraged working through the ideas introduced in the meetings, applied and extended what was learned  from the meeting; and engaged inquiry into their own contexts as preparation for work to be done in the follow-up meetings.

The *challenge* that they experienced in the *work away* sessions were seen when the activities provided during the sessions were not connected to practice. The dispute here was to be able to strengthen the activities to be in line with the teachers' context of practice in order to sustain this model. Work away is a concept that may help with the improvement of take up and implementation of the programme objectives.

This process was equipped with *resources and very highly qualified professional development facilitators* that provided the services. The uncertainty in this PDP programme was that the less ideal situations in the provinces might not be able to render such training if the context of the demonstration was different from where the project was to be implemented. Moreover the project facilitators of this project struggled to allocate budget and planning to the provinces which proved very cumbersome, and transferring these contexts to the districts became a huge predicament. This is also indicative of this programme, where clustering and community of practice was not practical as teachers were chosen from diverse metropolis, Feedback sessions became almost impossible within the group of teachers that trained in this programme.

However, the programme enabled professional development as teachers were able to reflect to some degree a take-up from the processes they went through in the PDP. The Professional Development Programme theory is potentially a good intervention and a needed in our time. Following some of the decision making on how the programme was to run, it was found that they consulted advisors and funders who highlighted a general need of teachers in South Africa owing to the curriculum changes in the aftermath of apartheid, that left teachers unequipped for the new curriculum requirements. The concern is could the PD programme theory have been better if teachers had been consulted systematically in order to know their views, deficiencies, expectations and the like.

. The PDP officials saw their core role to be

> [...] We definitely see it as our role and we thought by helping teachers to do something that they have to do anyway. If we kind of ask teachers what they know about local environmental issues and how to go about starting to do an action project, they don't know how to do it. So what we thought we could do is helping them to do it. And this is what we will continue to do. I don't see us deviating from this kind of thinking that we have at the moment. This is our mandate but we are linking it very strongly to Curriculum in assisting teachers to get them what they want to do (Achieng: FGI: 13-14).

This PDP's main goal was to help teachers to teach EE, which they considered as their main role. In helping them to do this they felt that Action projects would play an important role in developing teachers' knowledge and pedagogical dimension of their knowledge in EE. These Projects did not take up as desired.

**Action projects and attendance:**

The question is why were teachers not able to put action projects into action if curriculum formed an aspect of training? At the attendance list, the most unattended session was the presentation of action projects, but why was this so? I may attribute the failure to what Rossi Lipsey & Freeman (2004) explain as bias and service utilization. Service utilizations issues typically dissect into probes about coverage and predispositions. Coverage in the extent to which participation by the participants achieves the levels specified in the programme design; predisposition here refers to the degree to which some subgroups participate in greater proportion than others. A programme that reaches all projected participants and no others is obviously not biased in its coverage. But because few social programmes ever achieve total coverage, bias is typically an issue (Rossi, Lipsey & Freeman, 2004, p.200). Rossi et al. point out that, in assessing bias in programme participation they refer to examining the differences between individuals who participated in a programme and either those who drop out or

ascertain those who are eligible but do not participate at all (2004). In part dropout of participants in a project may be an indicator of clients' dissatisfaction with the intervention activities. It may also be an indicator of the condition in the community that militate against full participation (Rossi, Lipsey & Freeman, 2004, p.200). Such data might be collected from attendance registers or participation of the researchers in the research itself (see the attendance list, table 5.1). Below is attendance data that was kept by the PDP officials. A lot can be gleaned from this data and used for interpretation of various dimensions in the PDP. Below follows and interpretation in relation to action projects.

Table 5.1: Workshop Attendance.

| School | W/shop 1 Biodiversity 16 Feb 08 | W/shop 1 Biodiversity (Repeat) 1 March 08 | W/shop 2 Sustainable Development 15 March 08 | W/shop 3 Global Warming Climate Change 19 April 08 | W/shop 4 Active Learning Framework 17 May 08 | W/shop 5 Site Visit to Wolfgat NR 31 May 08 |
|---|---|---|---|---|---|---|
| B | 2 Educators | | 2 Educators | 2 Educators | 2 Educators | 2 Educators |
| C | 1 Educator | | 1 Educator | 1 Educator | 1 Educator | 1 Educator |
| E | | 1 Educator | 1 Educator | | 1 Educator | 1 Educator |
| G | | 2 Educators | 3 Educators | 2 Educators | 1 Educator | 1 Educator |
| H | | 1 Educator | 1 Educator | # | # | # |
| I | | 1 Educator | 1 Educator | 1 | | 1 |

| | | | | Educator | | Educator |
|---|---|---|---|---|---|---|
| D | 1 Educator | | 2 Educators | 2 Educators | 2 Educators | 2 Educators |
| J | 1 Educator | | 2 Educators | * | * | * |
| A | 1 Educator | | 2 Educators | 2 Educators | 2 Educators | 2 Educators |
| F | 3 Educators | | 1 Educator | 1 Educator | | 1 Educator |
| K | | 1 Educator | 2 Educators | 2 Educators | 1 Educator | |
| Total attendance | 9 Educators | 6 Educators | 18 Educators | 13 Educators | 10 Educators | 11 Educators |

In the table 5.1 above, attendances of five workshops are displayed and two of the sessions that were planned are not, displayed. The interviews revealed that seven workshops were used to conduct PD of teachers. However, the last two workshops are not displayed in the above data extracted from the document. This presents evidence that only three schools (four educators) attended these last two workshops which were not included in the above data. This raises the question: what happened to the rest of the educators? They were absent and the workshop had to be postponed. Interview sources indicate that these workshops were intended to polish the action projects for selection to the World Environmental Conference. (WEEC). What could have been teachers' reasons for lack of attendance when it came to the action projects? Could it be because of the unrealistic expectations from the PDP? Was it because of lack of commitment from the teachers? Was it because teachers were not able to comprehend and integrate what they had learned into practice? Could it have been due to their lack of exposure? Could it be an attitude problem towards Environmental Education? or the PDP training in general or could it have been the way they were selected into the programme?

While action projects were the focal point of workshops it is evident that out of the eighteen teachers that attended the workshops only three were able to present and implement action

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projects. From the totals of attendance above, it is clear that the highest number of attendance was eighteen educators; the least attended workshop was four educators? What happened to the number of educators who attended the action project workshop? Could it have been lack of proper communication? This speaks a loud conclusion to the theory and implementation of this programme. In the same vein, in November 2008 the following environmental action projects were submitted to PDP officials by the schools:

Table 5.2: Projects titles submitted to the PDP.

| School | Title of Environmental Action Project |
|--------|----------------------------------------|
| A | A comparative study of the biodiversity in Trout[32] and Snoek[33] through an investigation of the effects of pollution on aquatic biodiversity. |
| B | A long-term investigation into the effectiveness of the rehabilitation of the indigenous fauna at the codisfly[34] mining site in a beach (in partnership with Mining Company). |
| C | An investigation of the impacts of alien vegetation and domestic bore-holes on the volume and flow of the Silver[35] in the Elk[36] area. |
| D | An investigation into the effectiveness of the retention ponds in the Mali[37] area in reducing levels of pollution in the out-flowing rivers and the subsequent effect on the biodiversity of these water bodies. |
| E | A survey of indigenous knowledge about medicinal and useful plants followed by a biodiversity audit of the same plants in the Situ[38] community with the aim of restoring the plants in the area. |
| F | An investigation into the current sources of energy utilised in the learners' homes and schools in the Situ[39] informal settlement with the |

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[32] pseudonym
[33] Pseudonym
[34] pseudonym
[35] pseudonym
[36] pseudonym
[37] Pseudonym
[38] pseudonym
[39] pseudonym

| | aim to introducing the community to alternatives such source of energy… |
|---|---|
| | |

From the above data, only six topics were submitted for action projects. Out of these only three were realistic action projects that were evident during interview sessions and observations that were made. Out of the eighteen educators that attended, the table above records that only six schools presented a project and only two of the schools implemented their projects at the culmination of the PDP with this specific group of teachers. The rest of the schools forgot about the project's existence. What does this tell about the PD program?

From the foregoing therefore, it is clear that the attendance and the action project shows a partial achievement of what the PDP had planned to achieve. This indicates that the take-up was partial, and implementation failed to take place. Even though a few of the teachers implemented, the data show that majority of teachers did not implement their projects.

  In bringing together ideas from the literature review in chapter 2, action projects formed an important aspect of the literature that put this programme into perception. From the outlook of Jensen and Shnack emphasize that environmental education is pivotal to "building up student's abilities to act-their action competence- writing reverences to environmental concerns"  is vital in understanding the concepts and theories that underpins any PD in environmental education (1997, pp.163-177). Due to the complexities in environmental education professional development demands that students are made capable of envisioning alternative ways of development and to enable them to participate in acting according to these objectives.

Action competence therefore comprises an analysis of the nature of the environmental problems and an idea of education as something more than academic schooling or behaviour modification. Moreover, environmental problems are becoming some of the big challenges to democracy and humanity it is of the greatest importance critically to reflect up upon their pedagogical implications. Based on this assumption, they assert that environmental problems are structurally anchored in society and our ways of living. And thus, it is necessary to find solutions to these problems through changes both at the societal and the individual level. Thus the aim of environmental education must be to make present and future citizens capable of acting appropriately on a societal as well as personal level. The root causes and anchorage of

environmental problems have many consequences for the objectives, content and processes of environmental education.

Their concern is that because the environmental problems are so enormous and the way we present them to students might lead them to anxiety that might compound the whole process of educating them; they therefore suggest that the kind of environmental education that we do should embrace a pedagogical approach that will instil in students the courage, commitment and desire to get involved in the social interest concerning the issues that we teach. It is therefore important that these students become actively involved in a democratic society by means of participation.

They describe action competence as a formative ideal in a democratic approach to education. It is inclined to being able and willing to be qualified participants. It is also coupled with actions that must be understood and explained with reference to motives and reasons, rather than to mechanisms and causes; actions are intentional.

Jensen and Shnack promote action competence in environmental education as vital and give the following reasons for their argument:

> First, the dominance of scientism in environmental education, where the focus is often on giving pupils knowledge about the seriousness and extent of the environmental problems, has not been capable of addressing the social and societal perspectives involved in questions about the root causes of problems and the action possibilities which are open to society and individual. Secondly awareness that moralizing, behaviour-modifying teaching rarely if ever leads to intended behavioural changes have re-focused attention on action in teaching. Third, growing criticism of schools because of the priority they give to academic dimension at the expense of the more practical has led to increased attention being given to action oriented approaches. Fourth, Criticisms of simulations, games, role plays etc. and they often artificial as if situations, has led to increased demands for authenticity and thus also for participation in the reality of society as part of teaching (1997: 167).

Even though these perspectives are from Denmark, the data from this PDP reflect similar objectives to their PD programme in their action projects. The applicability of these notions in this programme would help in improving the objectives and the action projects to be realistic and obtainable within the timeframes located by the PDP providers. These ideologies would form a greater part in influencing a pedagogical approach to environmental education if transformation and sustainability in environmental education is to be achieved. These elements also need to form part of teacher professional development in environmental education because they have a capacity to broaden and open up educators' minds to a critical

approach to environmental education and transform the way we practice environmental education.

It is vital that action projects formed part of this PD. I would recommend that the projects that were left unfinished should be revisited and monitoring and support be rendered to the teachers in order to realise this objective.

Data analysis reveals the responbosibilitie of the PDP officials as outlined and discussed below:

- Resources and activities development, generating human resources, organizing workshops;
- Organize follow up activities with the advisors;
- Conduct training at the workshops;
- Act as liaison between teachers and department officials;
- Organize the whole PD programme process for teachers.

The PDP officials saw the knowledge and skill building as their main role to play in the PD process and hoped that department of education officials would then help with the support aspect. Now if these were their responsibilities, the researcher wonders how they determined take-up of the knowledge building processes as I did not see any clear report for evaluation of the processes.

On the other hand there is a mention of casual questioning and observation on whether the teachers liked the sessions or not. And this was the only way they felt they had created an impact. The next section will interpret the role of the PD in developing the curriculum that was used in training teachers.

### 5.2.1.1 Interpreting the role of the PDP in developing/conceptualizing the curriculum that was used in training the teachers:

In developing the curriculum that was used in training teachers, the PD programme officials looked at diverse needs of teachers. They brainstormed with department of education officials and the funders. This process excluded teachers who were only involved in the programme when the workshops were to commence. The school principals were called to an information meeting where they were informed about the focus of the PDP. After the meeting teachers were invited in diverse ways as recorded in the previous chapter. The resources they used were as indicated under the themes workshop design in chapter 4. They assumed that they

would have all that it takes to determine what teachers needed to know since their background as teachers was pivotal to their choice. Their objectives of the PD programme as an organisation also formed a basic aspect in formulation of the curriculum and the PDP objectives, Betty elaborates in a focus group interview,

> I suppose determining that it is the aims that we want to achieve, our particular needs as an organisation (speak unclear) and one of these objectives is to simulate information about bio diversity climate change, sustainability development issues. That's on the one side. Then we normally take that can say how is this fitting into what teachers must do. ... So that we are actually getting our messages across but at the same time assisting the teachers in what they need to do within the curriculum. It's not like we've done it (unclear) through teachers. We have done it through Curriculum Advisors (FGI: 11).

They also consulted the curriculum requirements for teachers and assessments standards which they incorporated in the curriculum they used for their training. If this was the case it is puzzling that the teachers still were struggling to implement EE in schools as they expressed that it is not part of the curriculum and the tightness of the curriculum did not allow them space to practice what they had learned. However, two teachers were able to implement partially what they intended to in their projects. Out of the six schools and eight educators that I interviewed only two schools had tangible action projects that they were involved in. The rest of the teachers had nothing to show with regards to the projects they planned to do. Does this mean that the PDP failed in meeting their objectives? No. To an extent they achieved knowledge objectives as described in the take-ups (Teacher's take-ups). But the action project objective was partially accomplished in two teachers that did the sand dunes and the water projects. This partiality can be attributed also to the absenteeism and lack of accessibility to the centre as have been described earlier. Rossi et al. indicate that, "accessibility is the extent to which the structural and organizational arrangements facilitate participation in the programme" (Rossi et al., 2004, p.200). Accessibility in this programme can be explained in terms of transportation to the site of workshop. Both teachers and department of education officials expressed their concerns about the day and the problem they experienced with reaching the training site. Transportation was also a problem because this led to lateness of workshop attendance and sometimes they had to either redo the workshops or cover partially part of the work they had planned to cover for the day. Betty gave further details

> There's very little public transport here, especially for example on a Saturday. The week days it is difficult, but on Saturdays it is impossible. Just maybe Achieng, with trial and error we came on the Saturday morning workshop phenomenon which did improve attendance generally. Because to try to do what you would do in five or so hours on a Saturday, you would need three

afternoons. The educators can only get away from school at a certain time. By the time they got hear from areas which can be up to an hour away, it's already three or later. Many of them really need to leave by half past four when it is still light, especially if using public transport. In fact, I think generally with teacher workshops, that was a lesson we learned very early on which actually did improve the chance of people attending and getting value out of a concentrated session where they will not missing a beginning and an end every time. (Focus group interviews)

This could have been a contributing factor to the extent of which take-up and implementation as time and stress levels in absorbing the concepts and putting them into practice could have been hindered. This also might have limited the numbers of drop outs in the last workshop where teachers were to be reporting on their projects and did not show up at all. However, one of the PD officials recorded that she had tried to do follow-ups of those teachers that were absent, and from some of them she demanded their commitment. I think the programme would have had no loop holes for dropouts if transportation had been available. The training should have been able to lead the teachers to find ways of implementing what they had learned within their context back at school.

In the same vein the training should have been able to equip teachers and lead them to find ways of implementing what they had learned within their context back at school. Similarly, Shawer (2010, p.599) indicates that there is an agreement that, teachers better advance in their professional skills through learning from actual teaching experiences. Curriculum development activities offer teachers rich learning experiences, where they would develop aspects such as subject content knowledge and decision making, critical thinking, pedagogical and curriculum skills. This can be a success and lead to improvement when teachers' curriculum development forms part of their professional training while embracing subject content-knowledge, pedagogical capability, reliability, trust and virtues of professionalism.

The planning of the curriculum could have intentionally put into perception, developing teachers' attitudes in order to necessitate implementation. I may attribute the low rate of implementation to the lack of the attitudinal dimension not being an objective of the training, as this would have enhanced take-up and implementation. Evans (2002) as depicted from chapter 2 expresses that professional development should be able to grip the components of attitude change versus functional development. She says, that professional development should embrace "an ideologically-, attitudinally-, intellectually-, and epistemologically-based stance on the part of an individual, in relation to the practice of the profession to which s/he belongs, and which influences her/his professional practice" (Evans, 2002, p.130).

Attitudinal development for her is a process whereby teachers' attitudes to their work are modified with the notions of intellectual and motivational focus while functional development is the process whereby teachers' professional performance may be improved with the notions of procedural and productive focus. She also describes two forms of professional development: 1. Role development as a process whereby the accepted parameters, remits and responsibilities of specific recognized specialist professional roles may be redefined and or modified, and 2. Cultural development as the process whereby teachers' professional culture is redefined and /or modified (Evans, 2002, pp.131-132).

Grasping this philosophical stand point in professional and curriculum development would intentionally train teachers to develop strong and positive attitudes towards EE. This would have increased spaces for implementation and take-up. On the contrary, the manner in which the teachers responded to the questions regarding this project's implementation instigates negative attitude towards environmental education. Even answering the interview questions signalled a waste of time for some. One of the teachers sounded too busy and had no time to discuss further as she does not sound interested. I diagnosed that the respondent's age and period of her initial training contributed to her lack of interest and accelerated her negative attitude towards EE. Her tone of response also suggested a waste of time and negative attitude. Her responses were too short and incomplete which connotes lack of interest. She also made mention that she travels a lot and has no time for action. She says, "I don't really know what. I don't want because I don't have the time" (Rose, SI: 9).

Regarding take-up of the curriculum, Pansies (from interviews),   expressed an attitude of positive change. For her the PD programme changed her attitude positively; she has gained more knowledge and developed an interest in teaching environmental studies. Daisy, demonstrates a positive attitude in her willingness to give more support in environmental education. She is very thankful that she attended the PDP training as this opened to her the world of Life Science and especially the integration of EE into Life Science. She is also positive in the sense that she was able to put into practice what she learned as she had no life science background. Cyprus has a positive attitude towards the PDP training.  She says that the training was a motivation for her. It brought renewal and growth in her career, which she was at the verge of terminating through resignation. It made Cyprus feel better about her own growth and ability. She sounded very motivated towards being an environmental activist and educator.

I think I do a lot of things differently. Just by the way, before I started the course my resignation form was in. There was no future anymore. My form was given in. It was the same old stuff and life of teaching is just one boring, you know? Then they said, what made me decide to … I ask the principal give me another chance; give that forms back to me. I will rethink the whole idea I will uplift myself. He gave me the forms and said: if you want to uplift yourself, fill in this form and go on this course. I did it with many other courses. It helps and it makes you feel better about yourself. You are motivated also. When I left the course it was actually a pity. But like I say, I use the garden still for my learners as an excursion because I think very little of our kids really go in to the garden, know plants, do any planting at home, know about bio diversity, know about recycle or reuse and stuff like that (Cyprus:5-6: SI).

Sisal notes that in his own teaching practice, EE is not taken seriously, it is not considered as the heart of curriculum- sadly an attitude that negates interest in EE.

Well, in my own teaching practises we don't take Environmental Education serious. I mean you focus more on the heart and so on. When we come to Environmental Education, then we normally leave it for the last. Then it is just a worksheet the learners work out. There is no really taking them in to the field. That is due to time Constraints and things like that (semi-structured interviews).

The respondent above is now aware that EE involves the field work in the environment and that it is integrated in life science - an aspect of new learning.

If the workshop contents could have given consideration to the way teachers learn (Weil and Mcgill 1989), the prior knowledge of teachers as well as the context and academic background of teachers they intended to invite to form part of the workshop, then take-up and implementation and greater achievement would have been in PDP development. This is essential because some teachers expressed the fact that they were not interested in the workshops since what they did at the workshop was a repetition of what they had learned with the exception of the Active learning Framework which they found valuable, again others only picked up the excursions and the outdoor learning. Determining the diversity of the teachers they selected to participate in the professional development programme could have increased spaces for more take-up and pitched the workshops to suit teachers' need. On the other hand, some teachers also indicated that they had learned a lot, whilst no accompanying implementation was felt from what they learned. However, I will argue that teachers' learning is progressive, dynamic, and reflective and take some time to unfold. This assumption therefore, connotes that it could be that teachers had learned so much, that given time for reflection and internalization of the processes they underwent, implementation would improve. However, this knowledge negates the time set for teachers to manifest take-up as depicted from the PDP objectives. Similarly, It was interesting how the PDP measured

teachers' learning. Because in questioning them how they went about assessing learning, they said they casually looked at teachers' faces and grasped from happy facial expression that they must have learned something. Goodwin and Oyler in the handbook of research (2008, p.484) posit that there is a need to know the kinds of strategies teacher educators use and when and how these strategies, interventions and gates impact, support and impede teacher learning and success. They also seek to know those strategies that work and those that do not work. They explain further that teacher education as a learning problem is concerned with "how teachers acquire the knowledge, skills and dispositions needed to teach and how they interpret their experiences in teacher preparation courses" (2008, p.484). Further knowledge on how teachers learn would or will accelerate how effective their curriculum is planned in order to achieve PDP goals.

It is of interest for me that in this specific programme it is not clear how the PDP officials ascertain teacher readiness to teach, or how to implement the training concepts in environmental education. Even though in their programme theory they indicated that they built in assessment, in reality this was not projected when interrogated. Godwin and Oyler (2008) point out the same concern when they address the dilemma of deciding who is ready to teach. They conclude that deciding on who is ready to teach depends on what teacher educators describe as quality teaching. Again, they attribute this quality to the teacher's input and outputs. Besides they promote certification as a profound way to know that teachers are ready. Determining the certification depends on the assessment of the teacher's knowledge, skills prior to the training and upon completion of the training and certification. It was not clear how the PD determined readiness of the teachers they trained to implement the components they planned to equip them with. This could have been a hampering aspect of the implementation. To batter on this issue, I lay emphasis on what I had analysed earlier to say that what the PD did was,

> [...] to create an audit. So the idea of the audit was that every teacher who was going on the professional development sessions completed this audit. It clearly gave us an idea, through very clever questioning of what they understood by the key terms bio diversity, environment, sustainability... As well as asking them about what resources they knew of, or which were available at their schools. In fact, what Achieng did in the workshops came from that. You had some stunning percentage like 87% or something of the teachers who were at that time teaching the curriculum that include word like bio diversity and sustainability did not understand in drawing in anything. They could not explain the terms (Betty, pg8: focus group interviews)

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At the same time, this at the end led to teachers not applying to their work what they had learned at the workshop. They did not say clearly how they determined this, but they felt that the teachers did not do as they expected,

> […] that they didn't take it down into their work, in to their curriculum and into the learner' work. Therefore we found that the impact of that Teacher professional Development process wasn't as great as we expected (Achieng: pg2: FGI).

> What we hoped to achieve that was we (Unclear) the knowledge building part and the skills building part. We see that as our strength. We hoped that the Curriculum Advisors would then come in as partners and continue the process back at school with the taking it in to the curriculum and putting it in to actual learners work and learners' portfolios which would then be assessed by the teachers for marks et cetera. And also that the Curriculum Advisors would continue to support the teachers into an action project. (Achieng: FGI-management perspective)

> And that is why we set up the project in such a way that it was a partnership. Yes, an organisation [Harambee] is a partner but they are the funders. For us a significant partnership was with the Western Cape Education Department, with the Curriculum Advisors (Achieng: FGI: pg. 2-3)

The PDP officials in their review documents records that the support aspect of the programme did not take place at all. This could have been a contributing factor towards only partial programme implementation and partial take-up among teachers.

### 5.2.1.2   Programme Support Functions

Programme support functions were one of the roles that were played by the PDP officials. Rossi et al. indicates that providing intended services is presumed to be a programme's main function, and one essential is to monitor; most programmes also perform important support functions that are critical to their ability to maintain themselves and continue to provide service (2004, p.196). To this regard, the PDP officials had this function designated to department officials. The specific roles that were expected by the PDP officials from the department of education officials was that of monitoring programme implementation and assisting teachers to put into practice what they had learned. The designation and partnership in this process was not indicatively clear. There was discord in the Reponses that emerged from the education officials for not playing their role in monitoring and supporting teachers. Further look and analysis of the PDP documents reveals that there was no explicit description of a monitoring tool, indicator or policies and guidelines that the PDP made in order to help the Education officials towards monitoring and supporting implementation process. I strongly feel that this must have been a contributing factor to Education department officials not

participating in monitoring at all. However, the Department of education officials indicated that the amount of workload and responsibilities that they had had impacted on their failure to monitor the programme's implementation.

In the role of selecting participants of the PDP one of the departmental official made request that the PDP officials should help them with a monitoring tool and criteria for selection. However, one of the departmental officials developed his own criteria in selecting participants. This action led to a lot of discord in teachers' response to the PDP. Rossi et al. categorically, put it that "Programme process monitoring schemes can and often should incorporate indicators of vital programme support functions along with indicators relating to service activities" (1984, p.197)  - such as indicators of good performance, or poor performance, that determines how the evaluation of teachers' learning and take-up will be perceived through training. These components would in turn improve the programme.

It is also significant that the informal and the occasional formal data that result from assessing or evaluating progress are studied, analysed, carefully interpreted and used to guide the interventions given to each individual. Creating a community of learning could have been one way that the programme functioning and support could have been improved.

### 5.2.1.3 Description of the programme operation /Conformity of the programme to Its Design

Assessing the extent to which a programme implemented resembles the programme as designed depends on having a full and accurate description of how the programme actually operates. This covered a range of topics as estimates of coverage and bias in participation: the types of services delivered the intensity of services given to participants of significant kinds, and the reactions of participants to the services. This was encapsulated using descriptive and narrative accounts as gathered from the data (Rossi and Freeman, 1983).

The degree in which the PDP runs as compared to its initial design is an essential element for assessment that this research paid attention to. Following this pattern of description would put me into repeating a lot of what I have discussed and interpreted, but I would simply say that this programme partially followed the described pattern; factors contributing to this partial achievement could have been the challenges as were described by the respondents in chapter four, and in the programme theory earlier in this chapter. Moreover, this is the first time that the programme is formally evaluated hence I can argue that the programme is in the process of learning and is potentially able to achieve its potential in the future. However, the

programme ran the workshops though not as designed, because they expected to do six workshops but ended up with eight due to absenteeism and the shifting of dates. Moreover, monitoring as planned did not take place as the department of education officials were not able monitor the implementation of the action projects as was planned. E-learning did not happen at all as was planned.

*Monitoring* is one of the areas in this specific professional development programme that when improved, higher take-up of teachers will be evident. Teachers expressed that they did not receive any support from either the PDP officials or the department of education official and this seems to have been the problem for implementing action projects. The intended roles of the department officials as envisioned by the PD programme was to render in- school support to teachers to ensure that the projects that teachers did entered into the learners' portfolios but this was did not happen . The department officials however, indicated that they had enormous responsibilities that hindered them in monitoring and supporting the teachers at school.

*Action projects:* Out of the eight teachers I interviewed, only two were able to setup visible action projects with their learners. One of the teachers worked on a water project and the other teacher worked on rehabilitating sand-dunes. The rest of the teachers did not even show a plan for a project they had made, not even the action projects. In digging deeper, I interpret that the two teachers who were able to implement projects are actually teachers who have studied up to postgraduate level and had some knowledge of environmental education. Again the same teachers were also involved in more than one professional development programme. Again their schools belonged to the Eco-school community. I thus would argue that due to their accrued knowledge and skills in environmental education and positive attitude towards praxis they were able to implement projects. In this way the PD programme can say that to some extent they had realised their goals. But the question remains; what happened to the rest of the four schools or the eight teachers that were involved?

*Collaboration and assessment of teachers*: This programme involved teachers from two metropolis which resulted in a separation of schools; a lack of interest also affected the programme as some teachers lost interest and stopped coming. Absenteeism was a challenge, especially when it came to the presentation of projects; just a handful of teachers came. The PDP officials assumed that educators would know how to implement strategies once they were back at school. This unfortunately did not happen. Problems occurred when teachers were asked to present their action projects. Only three schools were present. It became increasingly more difficult to visit teachers in class. At one point one of the department

officials was keen about the project, but along the line lost interest and was not available when needed. I therefore reflect that developing a culture of continuous assessment is an important component towards continuous improvement. Collaboration was limited among teachers. Clustering was not felt in this programme; as mentioned earlier teachers were from different metro poles so clustering was very difficult, except for one partnership that was evident. Professional learning community is a significant vehicle towards continuous improvement, but all too frequently progress, assessing and monitoring are not used to make thoughtful decisions about supporting a professional learning community to reach high quality implementation in a school (Hord and Sommers, 2008, p.114). Introducing professional teaching communities, clusters, or collaborative participative groups (Reddy, 2004; Garet and Porter, 2001; NEEP-GET project, 2005) into this PD programme is  an innovation that will improve teachers'  experiences and their way of learning together and working collegially together  in a school.  When done repeatedly for some time it will become a culture of learning and a community of practice that impedes professional development, take-up and implementation of the PDP processes in this programme (Hord and Sommers, 2008, p.114).

Since the school principals were part of the introduction at the preliminary meetings of the PDP information sessions, they could have been an instrumental tool that would have supplied implementation strategies if new programmes' process or practices were to be taken on board and used well alongside the Department of education officials. Whatever is to be monitored must have the attention of the leaders if the rest of the school community is to follow. An objective of the PDP was to develop lead teachers who in turn would train others but this did not happen entirely as was expected. Only one school was able to provide seeds to the neighbouring school, which was regarded as a step to 'lead teachership'. Again, only one curriculum advisor participated widely in other areas except for monitoring the implementation of projects and how it was filtered into the learners' portfolios.

*Leadership:* as seen in this programme was portrayed in PDP official as managers and facilitators, education department officials as support and monitoring leaders; and teachers as participants and leaders in initiating their own projects; and this is seen as having great importance in this evaluation.   In leading and managing this programme implies putting foresight into practice and facilitating the functioning of the organisation. Managing people is not identical to managing other resources. It means recognising and dealing with the vast array of human nature, life preferences and, significantly, opinions and emotions. I may attribute in part absenteeism and drop outs in this programme to leadership problems. In this

manner there is an operational dimension to leadership and the implementation of leadership and management skills. There are important fundamental issues of incentives and relationships; questions of administering information; and questions of authority and reliance. These are underpinned by the views of worth and morals held by individuals and expressed in the way in which the organisation is managed. Leading people in a context of change is a critical success in organisations (Kydd, Anderson & Newton, 2003, pp.1-2).

Leadership in this programme would have enhanced programme implementation as planned, if each of the leaders would have added accents to their roles in this PD programme. Leadership is path finding, implying movement towards an end point or goal. Leadership is doing the right things; such as fulfilling and accomplishing projected goals, aims and objectives. It focuses on creating a bigger picture about a desired future state (Kydd, Anderson & Newton, 2003, p.14). Leading is about foresight and scheme and providing stimulation to the people working in the organisation so that the aims of the organisation can be achieved.

In the same vein, organisation without vision, direction, order and discipline is one in which people performance varies and where individuals may not fulfil their full potential. Leadership requires learning and development. If leaders are to make positive contributions to raising  standards and increasing efficiency then they need to be developed and learned (ibid 29). Team spirit is also an aspect that is vital in professional development. The purpose of team spirit is achieved as a shared outcome or outcomes; and it is vital to expect that leadership in professional development programmes embrace this as effectively as possible. Now finding someone to do this is a difficult task. Putting this programme in perspective, it became evident that teamwork was lacking to an extent. The breakdown in communication to teachers with regards to feedback and monitoring is clearly an indicator of a lack of team work in this PDP programme as a whole. Team work is also not visible due to discord in the response from the teachers with regard to the duration of the programme and other issues discussed earlier. In order for one to be suitable for this kind of leadership that entails coaching for team work, he or she requires knowledge, understanding, skills and abilities to carry out the work. The development role of a leader or a manager requires an on-going development of people, in order to prompt adaptation of thinking and understanding and working styles for those involved in professional development in the rapidly changing climate of education. I therefore challenge the PDP officials to employ additional personnel to handle management, leadership and curriculum development, while another person does the training sessions and follow up. It was evident that one person doing everything in the organisation is

challenging to this programme as connecting and relating to the objects of the programme is demanding and difficult.

*Duration of the programme:* The programme was planned to run for three years in order to allow teachers to do action projects and report back about their progress. Some suggested that the duration of the programme should be in such a way that it allows teachers to participate and collaborate. The workshops as planned did not allow teachers time to become reflective participants in the workshops. They had so much to learn and information to store through the lectures and did not allow enough time for collaboration. Even though the time allotted for the programme was three years, this time was not utilised as planned. There was no dialogues, feedback and monitoring of the process.

*Form of activity* The project as planned was to be undertaken in a series of workshops followed by action projects. These workshops focused on topics as: climate change, global warming, biodiversity and active learning programme. Learners were expected to participate and complete action projects-these were discussed earlier in data analysis under the theme on workshops. In the plan the project included a built-in assessment and evaluation process. The assessment and evaluation is said to have been part of the PDP process while in reality it happened very informally. The project's inbuilt assessment was not formally assessing the take-up of learners, a reason why teachers' take-up in implementation of action projects became cumbersome to most teachers. If assessment is to drive learning then, the question is, what kind of learning were the teachers obtaining from the programme? Did the knowledge align with PDP objectives? This aspect of assessment was not intentionally part of the inbuilt assessment that was planned. Garet and Porter says, that "A number of authors argue that professional development requires a dual focus on both knowledge of subject matter content and an understanding of how children learn specific content"(2001:916). I see this as an important aspect that was left out in the planning of the workshop activities.

The workshops were intended to run for one year, the projects one year and then the third year was to be feedback on progress and leading others teachers in the neighbouring communities through the same processes. Did this happen? What happened was that the workshops went through into the first year, and some teachers indicated that they were not aware of what happened in the remainder of the two years. This is an indication that communication to teachers was not very clear as to what they were expected to do within the following two years. Teachers communicated their lack of understanding and awareness of what was really going on. However, two schools used the second year to implement their projects but were

not sure what the third year was for. Some of them expressed that they had been expecting to be called back to report on what they had done but this did not happen. I was to observe this session, but this did not happen either. Thus workshops formed the major part of the PDP as seen in this programme.

### 5.2.1.4   Comparison between Sites

When a programme comprises a variety of sites, it is important to examine trepidations in the diversity of the programme accomplishment amidst sites. Comparison of sites permits an understanding of the sources of diversity in programme implementation and in the differences in staff, administration, targets, or surrounding environments and it also can facilitate efforts to achieve standardization. The spaces in which this PD programme was conducted and implemented are crucial (Rossi et al. 2004, p.198). In this programme there were various things to look for as far as the diversity of sites was concerned.

Firstly, the PDP sites in which the workshops were conducted were very different to the sites in which the implementation of projects was to happen. Where the training took place, the site was well equipped with natural resources, spacious, good environment, adequate facilities, stocked libraries and equipped personnel. Some of the lessons the teachers did at the workshop led them to having access to the natural setting in which they could observe, investigate and formulate projects; however, at the schools where they came from, they were limited in resources, space, time and innovation to set up projects as envisioned. Some schools had very favourable settings which allowed them to carry out implementation. Others, in comparison, came from very poor socio-economic locations that were not encouraging for any implementation. One of the teachers had a very big dream about her project but, it was not practical for her school situation and environment. Others were more advantaged and had the resources to be able to implement which some of them did but others did not, which I may attribute to negative attitude towards EE and a lack of interest.

Additionally those that were disadvantaged by location and environments to implement action projects were able to use the ideas they obtained from the workshops to improve their lesson planning of teaching and pedagogical approach in their general lesson presentation. Concerning this I describe the extent of professional development. They became more aware of the curriculum contents,  gained knowledge and information about diversity, climate change, global warming, and active learning framework as a conceptual framework to conduct inquiries  and do EE lessons as well  as  how to plan for action projects and skills in

lesson planning and presentation. Training sites varied and this partly necessitated the take-up that the teachers spelt out in Chapter four.

But sites for possible implementation also varied in some cases and not in others. Despite differences in sites, professional developments evidenced to some extent as teachers were able to articulate what they lacked or were not able to do and identified reasons why they could not do certain things- this in itself is an action competence.

### 5.2.2 Interpretation of the activities of the Department of Education Officials: Support and Monitoring Partners

The PDP officials planned to work with three education department officials who were to help them in selection of schools, liaison roles, and formulation of cluster groups, monitoring and evaluation and sustainability and co-instruction of the programme. Out of the three advisors, one was concerned with strengthening e-learning (Review document from the PDP). Achieng explained in the extract below:

> […] their role is going to be, they supposes support teachers in Curriculum in their assessments. For example, every teacher will know at the beginning of the year that this is the number of assessment I have to do. The Curriculum Advisors' job is to go and say, fine, what are you going to be doing for each one of those assessments, and does it therefore meet the standards and requirements of each kind of assessments that has to be done. So our idea was that, our partnership with the CA would do that, would assist them to get it in to the work (Achieng: FGI: 13-14).

During the interviews the Department of Education officials said that they understood their roles to be in a rigorous research process for the project proposal, help in selecting teachers as participants of the workshops, provide support to the teachers to ensure implementation, ensure that action projects meet scientific criteria required by the Department of Education, create awareness of the PD programme, link between the teachers and the PD programme, check alignment of the PD in relation to the national curriculum requirements for teachers before they approve them into schools. These officials uttered vividly their roles and additional responsibilities but the question is: did this happen in reality? They did select teachers who participated in the training, but I did not see how they formed the clusters that were mentioned as part of their roles. Gleaning from the literature review in chapter 2 about the NEEP learning for sustainability project, Curriculum advisers needed to developed *clusters* to stimulate *dialogue* and c*ollaboration;* schools were selected from close propinquity and convenience to form clusters and teachers were also selected from each of the schools, these teachers met on a regular basis with the project staff member and any

departmental staff who wanted to join them. Attendance in these clustered meetings varied in some cases but was generally regarded as satisfying. This could have been ideal lessons that will help this programme to improve and be sustainable.

In the NEEP programme, these clusters optimized collaborations and collaborative learning and made it possible for constructivist strategies to function well. The duration of the training spoke aloud as teachers and subject advisers who were involved were able to go into depth with curriculum issues and with issues associated with educational transformation (NEEP-GET C, 2005). Even thought there were successes, the project developers battled with issues of time frame for teacher professional development. As compared to the time and professionalism which accompanied the sessions and the available funds in the NEEP-GET, it was critical as to whether the same context would be available for future continuing PD for teachers in environmental education in other provinces. In the same vein, the department of education officials needs to learn from this project and create a continuing PD in the schools where they are advisors.

Trust, confidence and competence were those qualities that enabled NEEP program to thrive and one wonders if or how this can be cultivated in this PD programme to enable monitoring and support for this PDP as this connotes improvement and sustainability of this collaboration and partnership.

Linking this to the discussion in chapter 2 regarding indicators of effective PDP, Collaboration or collective participation of teachers from the same school is a  factor that the Department of education officials should have  paid attention to in order to expand their knowledge and skill with focus to content knowledge, as well as active and inquiry based learning approaches. Even though inquiry base learning formed part of this PDP, it was not monitored for effectiveness. Collaboration connotes teachers working together contributing their own expertise as they put ideas together to improve their practice. Additionally the education officials in their role of selection and monitoring needed to do it in such a way that teachers would have been enabled to collaborate actively in promoting the implementation of the new ideas in the PDP. Collaboration improves and builds relational trust among teachers within the PD as well as in their school context. In addition collaboration also becomes effective in the coaching process of a PD in order for implementation (English, 2005, p.68). Frost, Akmal and Kingrey, promote collaboration as a means of providing effective and sustainable teacher professional development (2010).

Neither did they do any monitoring or support for teachers during implementation. As co-instructors they did not come out either. From this understanding, it is notable that the partnership and support that was displayed by the NEEP project that was discussed in chapter two would help improve aspects of clusters and support systems.

### 5.2.2.1  Interpreting Monitoring service utilization: integrating Rossi ideas.

Department of Education had as their main role, monitoring the implementation process of the PPD. This being an important aspect of the programme objective, their role in monitoring is crucial for interpretation and toward improvement of this PDP.

Rossi et al. indicate that "Critical issues in programme process monitoring are ascertaining the extent to which the intended targets actually receive programme services (2004). Target participation concerns both programme managers and sponsors. Managing a PDP effectively requires that target participation be kept at an acceptable level, and corrective action be taken if it falls below that level" (p.183). The question here is who determines the acceptable level at this stage? As I looked into the data analysis, this question was a crucial one that that informed my outlook of analysis and interpretation.

The Programme had two personnel who were concerned with the curriculum planning, training through workshops, and then taken the teachers to excursions and communicating with the department of education officials about their plans yet the department of education officials were to monitor the programme. Monitoring and support did not happen in this programme as was planned. The reasons that emerged for this failure was that there was no monitoring tool to assist them, the responsibilities and workload on the side of the officials was enormous to reckon with. The later reason puts this programme as a secondary concern and not a priority. Moreover, some of the officials had been transferred and there was no continuity to this regard. More on this is discussed in Chapter six, regarding partnership.

No matter how busy the curriculum advisors were, it was negligence on their side not to monitor this programme. They could have opened up channels of communication with the PDP officials to communicate their failure to monitor the process. On the other hand, I would say that the process of partnership needed a contractual process that would instil commitment, and not volunteer attitude that I understood to be reflected on the programme monitoring. Tsui and Law postulate that activity systems are collective, goal driven, governed and mediated by rules; there is also a division of labour that is explicit and implicit to the organization of the community (2005). The organisation mediates the transformation of the

object of the activity system into the outcome. The organisational rules, help in enhancing and defining how participants are expected to behave and who is expected to do what in the achievement of the object of the activity system. This should then be communicated to the stakeholders within the organisation. Despite the amount of workload the Education officials had, it was not right not to monitor the project at all. And I think this amounted to the partial take-up with reference to the programme objective.

### 5.2.3    Interpretation of Activities of Teachers: Participants in the PDP

Teachers were the main participants in this PDP. They were the object of the PDP. The professional development process was geared towards improving teachers' awareness and equipping them with necessary knowledge and skills they needed to teach environmental education within the life science. Teachers therefore formed an important aspect of the evaluation of this programme. In the interpretation of the activities of teachers, important questions regarding take-up, implementation and the extent of professional development will be addressed. An interpretive understanding gleaned from Chapter 2 will influence this interpretation.

Reddy, sees professional development as a process of democratization that enables self-development, self-fulfilment and self-determination; this, Reddy further argues, can be achieved through opportunities that are accorded to teachers (2004). This democratization of PD can also be seen as a reflexive process of liberation of thoughts and practices in order to prevail freedom of choice and emancipatory practices.

The insight, comprehension and conception of professional development determine the kind of goals, perspectives, ideologies, epistemology, ontology and practicability that a particular PD programme will run. Professional development should be seen as "an ideologically-, attitudinally-, intellectually-, and epistemologically-based stance on the part of an individual, in relation to the practice of the profession to which s/he belongs, and which influences her/his professional practice" (Evans, 130). Professional development has attitudinal development and functional development dimensions as important indicators of effectiveness in professional development. Similarly, Panuel et al. depict that the design of the professional development should ensure that teachers' learning and activities to be used during the period of learning are appropriate and able to facilitate learning (2007). Did learning take place and to what extent? In the same vein, Adler et al. note that the clearest design and delivery of teacher education programmes as contained in section five of the norms and standard for educators as Gazetted on the 4th of February 2000; describes the transformation of existing

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practices with regard to standards for design and delivery of educator development programmes which has been understood as, the ability to put into practice in the relevant contexts, the learning outcomes achieved in obtaining a qualification (2002, p.27). This is further determined in quality learning as applied competence.

In the same vein, this PDP also worked with teachers as participants in the workshops. An aspect of the context was initially (in their earlier documents) working with ten schools, but I interviewed eight teachers from six schools (these being the schools I was introduced to). The teachers were expected to attend workshops and plan action projects. These were then expected to be reflected in their learners' portfolios. The same trend as explained by Adler et al. seems to be the pattern. That is to say that context, plays a very important role in teacher education and this determine aspects of learning that teachers would then apply in their practice. The interpretation that follows regards the understanding of the take-up of teachers from the PDP processes.

### 5.2.3.1 Take-up

Take-up is one of the most important things that this PD was to evaluate. Take up as considered in this research referred to the learning of PDP officials, learning of the teachers and learning of the department of education officials. At this point I will discuss and interpret the learning of teachers. I will look at what the teachers were able to learn from the PDP. I also look at the factors that influenced the degree of take-up and how the process can be improved. The interpretation then constitutes gleaning from the literature and referring back to the teachers' context.

I describe take-up as learning, and learning as described by Villagas Oyler 2009, p.554), is "the process by which students construct meaning in response to new ideas and experiences. In so doing, learners are said to use their prior knowledge and beliefs which they have stored in memory as mental structures to make sense of their new input". Good teaching therefore helps students to build bridges between their prior knowledge and experiences both personal and cultural and the material to be learned. This requires that in addition to knowing their subject matter, teachers need to know their students well in order to help them build these bridges. They also need to be able to use a variety of pedagogical strategies to involve student of diverse backgrounds in learning. Adler and Reed (2002) researched on teachers' take-up and concluded that teachers' take-up is very complex in that it encapsulate: practical competence as the demonstrated ability in an authentic context. The complexity of take-up must also put into consideration a range of possibilities for action, and make considerable

decisions about which possibility to follow and to perform the chosen action. Teacher take-up is grounded in foundational competence where the teacher as a learner demonstrates an understanding of the knowledge and thinking that underpins the action taken; and integrated through reflexive competence in which the teacher as a learner demonstrates ability to integrate or connect performances and decision-making with understanding; and either an ability to adapt to change and unforeseen circumstances and to explain the reasons behind these adaptations (Adler and Reed, 2002, p.28).

Adler and Reed (2002) analyse this by saying that, in teacher education knowing and reflecting is crucial to the education of teachers and again, place time and doing as essential. Thus order for teacher education programmes should develop applied competence teachers need to be in classroom and school focused. In order for teacher education to meet global demands it is important that the following intellectual attributes be realised as:

- Deep understanding of "higher order" concepts and perspectives… rather than the acquisition of low –level facts and information.
- Reflexivity…. An ability to rigorously evaluate and if necessary reconstitute our own thoughts and actions.
- The ability to think metacognitive… to recognise that our claims to knowledge are always susceptible to further and even-higher forms of evaluation.

(Adler and Reed, 2002, p.28)

In this PD programme, teachers were exposed to lots of information regarding the workshop contents, and also to lesson planning about the various workshop topics; they were then asked to choose action projects to work on but this failed to take root by most of the teachers. Could there have been a problem to a lack of instilling in the teachers the ability to think metacognitively and recognise the claims of knowledge that they gained through the process? Could it be that the understanding of teachers or the concepts and perspectives on the various topics were of low quality or level and consisted on facts? Or teachers were not exposed to reflexivity? As most teachers failed to do their action projects this could be partially attributed to the fact that their inability to reflect on what they had learned in order to form their own thought and action projects.

## 5.2.3.1.1 Challenge of activity, time and place

The teachers were not clear about the time allocation of the programme. Diversity in teachers' response with regard to the time the programme was to take also raised a lot of questions as to whether this was communicated to teachers. Others mentions 3 years while others experienced only one year and the others expressed the second year; the challenge was what happened in the third year? Another aspect was the place where the workshop took place. Most teachers expressed difficulty in reaching the sight of training, others expressed the fact that the resources that were used at the training site were not obtainable in their schools where they work and this posed a lot of challenges for implementation of some of the things the learnt. It was evident that some of the schools developed similar gardens and resource to aid their implementation but most schools were plagued on the same. It is paradoxical because is the programme documents the years were stated clearly but did not happen as planned. The nature of the knowledge that was planned for this training was familiar to most of the teachers and insinuated sense of repetition and boredom while to some was a source of wisdom and professional development. These are factors that I gather influence take-up.

Teaching is a complex, tension field (Adler and Reed, 2002). She adds that teaching involves both knowledge and pedagogy, about learning and the learning context. The reason why there is much demand on teacher education is due to the fact that curriculum reforms calls for continuing teacher education in order to meet up with the complex and continuous changes in the curriculum. This programme being a professional development of teachers in environmental education was prompted primarily by curriculum change that took place in South Africa. Adler and Reed affirm that all development programmes are required to manage the tensions inherent in:

- Nature of the knowledge selected by the programme, a balance in educational activity and the between subject and pedagogic knowledge and between theoretical and practical knowledge.
- The location and duration of the programme. Where teacher learning is best conducted and for what length of time. (Adler & Reed, 2002, p.3)

Crucial questions arise where concerns about how intentional opportunities that enhance the learning of teachers in maximizing their potential, developing their vision, knowledge, practices, frameworks and dispositions need to promote teachers learning. (Feinman- Nemser 2008, p.698). In the same vein, I would like to interpret what the teachers learned from this PD programme as projected in the analysis and to see whether this measures to the objectives

that the PDP conceptualized as objectives were met. The PDP intention for the teachers was to:

- To build educator's content knowledge
- To develop global environmental educators through capacity building pilot programmes which this focus on teacher professional development.
- To expose educators to active, learner-centred approaches.
- To assist educators in developing their own lessons on the topic and to provide learners with an opportunity to actively participate in action projects.

In working towards the above aims the project intended to build capacity among Life Sciences educators through a focused teacher professional development programme to *'be lead teacher'* in implementing action environmental projects within the curriculum and ultimately to become cluster co-coordinators who will be able to train others. Whether these objectives were achieved is discussed in the section that follows.

### 5.2.3.1.2 What the programme achieved from the above objectives as described by the respondents

One of the teachers reflected that she had learned a lot from the *practical aspect* of the workshop, especially where nature was brought into the classroom as they learned. She also discovered new *ways of integrating new knowledge* with her prior knowledge before coming to the PDP. She discovered *new ways of teaching and new curriculum content/information.* This teacher had received her training in the 1970's and attending this programme 'opened her eyes' *to the new curriculum and ways in which it differed from her initial training.* Moreover having a Bachelors in Zoology her view of environmental education was limited, thus this training enhanced and *expanded her view of this type of education.* The above mentioned information shows that some form of learning took place. The excerpt below concurs with this that some learning took place.

> […]am… just what we am...am…we go by diversity we took different pictures into different groups according to … or whatever that we can bring into class, that was quiet interesting, yah, yes, we didn't do ecology, the way is being done today ehe, eh, ehe… (not clear) what is municipal population, what is community, it was book work, we didn't go out with the children, am, they have the illegal ecosystem which they investigate, but nowadays it is more… diversities… more clearly into the curriculum. We didn't study anything about… even when I was in the university. And what the effect of invader is and … em problems (Rose, Semi-structured interviews. 1a:2a)

In some of the schools the teachers *felt and expressed empowerment*. Some felt that they were prepared to be '*lead-teachers*'. Two teachers felt more empowered I gathered that these two teachers were different in their learning because of multiple factors, not only were they involved in this PD programme but also in other projects and PDs alongside. Besides, one of the schools belonged to an eco-school community. *"The PD programme project empowered us and trained us to train other teachers as well as in other schools. We are regarded as lead teachers in environmental education. We make use of our school to conduct training"* (Cactus, Focus Group interviews: 7).

The teachers felt *more knowledgeable*, more empowered: They discovered new ways of teaching, became aware of new curriculum contents in environmental education and how to *integrate the new knowledge into their contexts,* they also *learned to work cooperatively* in groups and through collaborative efforts in the diversity of the teachers that were present at the PDP. They discovered more the diversities in plants and their significance, gained a lot of information, felt motivated, and showed *improved positive attitude* towards EE. The PDP granted teachers *more freedom and allowed them to work without tensions*. They felt more able and developed new understanding, and were able to differentiate between Environmental Education and Environmental Studies. They also learned about the *active learning in environmental education in the community*. Teachers learned about *issue based approach to learning in environmental education.* Moreover, they developed new ways of viewing environmental education generally and how it appears in the curriculum especially in life science. Some also learned about the practical technical structure of how to develop a programme which helped them to do EE in a more constructive way. The gained insight and learned about active learning framework as a tool to become more constructive in teaching environmental education. Some of the teachers indicated that they enjoyed the programme and found it entertaining; Daisy expresses that the PD programme offered her extra knowledge on global warming and sustainable development. The PD programme played a role of refreshing her knowledge on things that she already knew. Daisy also indicated that the PD programme was entertaining and that she enjoyed it especially the outdoor practices and her involvement in doing their own projects on sustainable development.

The PD programme enabled the refreshing of the knowledge teachers possess, often underutilized and theoretical and how to put it into practice by using the PD programme. Cyprus learned from the programme, a different approach to EE as compared to her initial training. She learned to be *more deliberate and intentional about environmental issues*. Amongst others she learned to instil practically the idea of sustainability, got more clarity on

EE topics; plants diversity and medical aspects of plants and awareness on environmental activism.

Moreover, Cyprus learned to bring across her lessons in a better way *by engaging the learners*. After implementing some of the things in her class which she had learned in the workshop, she observed a tremendous improvement in her students' marks and interest in learning more about the subject. Her students also developed practical attitudes, skills and knowledge on environmental awareness in that they cared for their own school environment by picking up trash. She also taught students to work cooperatively, which she had personally practiced in the workshops- a learned technique in teaching. She learned practically to bring learners in touch with the object of learning which was most effective for her. Cactus expressed their implementation of *the action project* that they have started in *rehabilitating the Hake Sand dunes*, which he indicated *encompasses the curriculum requirements and is fitting into their classroom schedules* and is still on-going.

These were 'take-ups' that teachers expressed concerning the training they gained from PDP. However, the PDP had a vision and an objective of action projects that teachers were to participate in. Yet, this only was partially achieved. As a practice for improvement, formative evaluation compels me as an evaluator to ask questions and to clarify the goal of this Professional Development Programme, like Hord and Sommers (2008, p.101) affirms, "Your goal as a leader is to help yourself and others to define what they do want in other words, clarify the goal. Sometimes it involves restating the goal several times in different ways. Restating goals adds clarity and gives a chance for others to speak about what it means to them". Reflections questions like: what does the PDP officials want to achieve through this professional development programme? And how are they going to get there? Are important questions that need deep reflection during conceptualisation of PDP objectives and goals (Hord and Sommers, 2008, p.101). Reflection like these involves thinking back on something that has happened. In this PDP, the PD officials and educators would take the results of their professional development processes and reflect back on what they did and what they might do differently next time to get different results and start to access patterns in their professional development practices. This is a process that requires time, critical thinking, creativity and innovation. This kind of exercise, research suggests improved Professional Development Processes, instructions and student achievement (Hord and Sommers, 2008: p.103).

### 5.2.3.1.3    What the PDP did not achieve –interpretation of teachers' perspective

From the analysis Teachers pointed out things that they felt the PDP did not achieve as was intended. Some felt that the objective of training "lead teachers" did not happen in reality. Sisal reveals that nothing has happened so far as being a lead teacher is concerned. He says that he was to become a lead teacher but has not done anything because he had not heard anything from the PD project. He says "No, nothing. I was supposed to become a lead teacher and guide other teachers. I haven't heard anything from PDP…" (Sisal: SI 24). The training needed to have left teachers ready and aware of their leadership role in mentoring other teachers through the same process, but this did not happen in view of what Sisal depicted. He also noted that, opportunities would have been made authentic to allow them to collaborate with one another in order achieve this goal but he could not. However, he would have shared with the other four teachers, but that they had different projects with their learners and he always did his projects with his learners as well.

Reflectively, the problems teachers have with this PD programme are that the PDP officials did not engage with the schools more often to ensure that the teachers and students are in equilibrium. Even though the department of education officials were to ensure the implementation teachers saw it as a responsibility of the PDP officials. This should be communicated clearly to the teachers. Sommers & Hordes emphasise that, when we embed reflective practice into the culture of the school through professional learning communities, we facilitate the transfer of information, we widen the use of effective practices and trust is built through enhanced relationships (2008, p.105). Sharing our human resources moves the organization a head. Reflective practice would have formed a bigger part of the professional development that these teachers would have gone through in order to implement appropriately the intended outcomes of the workshops. *(For workshop out comes see workshop objectives in chapter 4 in data analysis)*

*Implementation of action projects* was partially achieved through some of the teachers carrying out their action projects which are still on, otherwise out of the fifteen teachers that attended the training, most planned their projects, but only two schools were able to practically implement the projects that they planned (*see more on implementation chapter four under implementation-theme appearing under teachers*). This can be partially attributed to a lack of monitoring and support but also to teachers' attitudes towards environmental education. Challenges of workload and school routine might have been some of the causes for the lack of implementation. Based on conversations with educators, Sommers and Hords

(2008, p.105) point out that "there continues to be massive overload for the adults working in educational systems. The demands continue to rise from inside and outside the organization. It seems that almost every solution to social issues becomes the responsibility of the school system".

Teachers also expressed disappointment with the PDP officials. They felt that the programme ended with the workshops, because nothing active took place from the time workshops ended. They conveyed the message that the programme seemed to have been a year's thing and a once off thing instead of the prescribed 3 years (see Chapter 4 data analysis themes for teachers). Promises were made and certificates were promised to the teachers but this did not happen. The teachers felt left alone without further communication. They did not have any feedback sessions on their projects as well. "Nice people that work for you the whole year. They said they will give certificates to show that we were part of that... We just feel like left alone" (Focus group interviews: a teacher). This teacher did not see the PDP as part of her practice; she saw it as working for the PDP this is an attitude or notion that should have been addressed during the workshop and the outlining of the PDP objectives to teachers. These disappointments or 'unkept' promises might have been causal agents of failure for the implementation of projects. Hords and Sommers (2008, p.106) identify causes of conflict in organisations as Power, scarcity or resources, diversity due to cultural conflicts caused by migration, race, ethnicity, disabilities gender and changes in educational systems, power differentials. Conflict management in an organisation reduces tension and increases productivity. If this might be the case with this PD programme then, Trust is important if professional development and motivation are to thrive. In the words of Sommers & Hordes (2008, p.05), "Trust is a social lubricant that makes organizations run. When trust exists, organizations tend to think more creatively, take more risks, and share information more readily. There is a feeling of being supported."

5.3 **Summary**

This chapter is an interpretation and discussion of the data as analysed in Chapter four. The data was interpreted in three distinct paths that were described in diagram 3.2. The data as interpreted involved all stakeholders that were involved in this PDP. In the interpretation of data from the PDP officials it was evident that the programme theory was well conceptualised, however, there is more need to reconceptualise aspects of the programme theory. Programme theory needed to include aspects of teachers as reflective practitioners and critical thinkers, who can participate actively in their professional development. Improving the curriculum by involving teachers and re-contextualizing teacher programmes to suit their specific needs and contexts was an important aspect in the interpretation. Improving communication and building better and more cohesive communication channels is envisioned to improve the partnership problems and would lead to a greater take-up and implementation. Developing a better and a committed partnership that is regulated by rules will enhance effectiveness in monitoring and support for teachers in order to improve the implementation. Action projects as planned did not go well as it was intended. Literature reveals that actualization of action projects begins with better planning, early selection of projects, mentoring and setting of achievable goals within a given time space. Action competence should form part of the action projects that is used as a tool to gauge achievement in action projects. Continuous support and monitoring of teachers progress through mentoring and feedback sessions would enhance the actualization and create cohesion and synergy that teachers need to implement action projects.

Interpretation from teachers reveals that there was take-up of content knowledge from the workshops. Teachers also learnt integration of EE and life sciences and pedagogical dimensions of environmental education in active learning. They also felt more empowerment. However, there is a need for teachers to be committed to the workshops and attend regularly in order to allow continuity and mastery of the intended outcomes of the PDP in order to enhance implementation. Teachers faced a lot of challenges in terms of transportation, time and communication. The realisation of action projects was achieved only by a few teachers.

Department of Education officials failed in their role of monitoring due to the amount of workload and lack of monitoring tool. Improving aspects of partnership and commitment will enhance implementation, monitoring and support in this PDP.

# Chapter 6
# Concluding remarks, reflection and reflexivity

## 6.1 Introduction

This chapter will highlight the conclusion regarding the evaluation of this PD programme and the possible areas that require improvement if this PDP is to be sustained. This chapter is concluding on important aspects that I depicted from the analysis, data interpretation and further literature that I gathered would help this programme towards improvement. Important areas for this conclusion regard aspects like: the contextualization of teacher professional development, a factor that might help in improving this programme. This I find vital owing to the fact that teachers were selected from different backgrounds. Partnership is a very crucial component that influences take-up as depicted from the programme. It influences the nature of the implementation and monitoring aspects of the programme. Partnership to an extent determined the level in which the teachers acquired the skills and knowledge that were intended. Another main factor that I feel needed improvement is the support and monitoring system which came out as a lacking dimension in this PDP. Further suggestions are made in concluding remarks on components that I felt needs to be improved or integrated to enhance greater amount of take-up, implementation and intensify the magnitude of professional development that would be obtained from processes like the one this PDP had planned and displayed. Then I will reflect on my research journey this far.

## 6.2 The need of contextualization of teacher education programmes in Environmental Education

A snapshot of the nature of teachers that were selected for this PD indicate a variety and diversity of backgrounds, regarding their knowledge, age group, learning styles, academic achievement, content knowledge regarding EE and life science, different economic background both from the schools they were coming from, and collaborative abilities. This diversity calls for a programme that is contextualized. The analysis and interpretation reveals that there was a discord in the expectation of teachers, with regard to what they intended and what really happened during the PD. Some teachers, found the training enriching and an adventurous one while others found it as information filled and a repetition of what they already know, yet wished they had more outdoor experience than the lectures they had. The various attitudes and responses displayed by the teachers calls for a contextualized PDP.

On the same vein, Evans (2002) maintains that the thoroughness of approach given to teacher professional development greatly depends on how one conceptualises the process of the

professional development of teachers. It seems that one of the reasons teachers' negative attitudes towards the development of action projects in this Environmental Education programme was prominently due to the conceptualisation of the programme development and its conceptual paradigm or programme theory. If the programme developers had been able to sustain a coherent design and purposeful programme they would have been able to meet the target group of teachers they aimed to train and this would have led to the attainment of the whole programme objectives (Evans, 2002, p.129; Du Preez and Roux 2008, p.7).

Teachers should have been involved from the very beginning in the conceptualisation of the programme, in order to contribute to the curriculum content and needs that they had. Since this was not done, a response of discord was obtained from various teachers as has been explained earlier. Methodological framework and conceptual underpinnings should have made provision for teachers to be role players not only as participants but also as part of the curriculum development processes for the PDP (Du Preez and Roux 2008, p.78)- Since they were the object of the programme. They could have actually carried an intervention participative research before the actual implementation of the project to see how the programme would be practicable- epistemologically, ontologically and constructively (Du Preez et al., 2008, p.82).

Teacher education has been acknowledged as being pivotal to the UNESCO's strategy in realising a sustainable society. There has been much effort in the environmental education and Education for sustainable fields to reorient education towards sustainability; however these efforts have tended to engage with teachers already interested in or committed to education for sustainable development (Ferreira, Ryan and Tilbury, 2007, p.227). This PDP is an example of a programme that had a mixture of teachers and included teachers who were already engaged and trained in the same field. Putting up a programme like this require that their context be put in mind during planning so that it does not create boredom to teachers who already have been in the a similar programme. Moreover, this attracted the theme, that I named "nothing new", this theme suggested that some teachers learnt nothing new from the PDP. Therefore, inclusion of such teachers would require the content and the training to be pitched to a higher degree that would meet teachers' needs for professional development. This would have also attracted diversity of approaches in the PDP form of activity.

That is why being able to diagnose teachers' needs before embarking into professional development in a particular context plays a very important role. Even though the context described by Ferreira et al above was in Australia, it is very much what this programme

experienced. (Although the context described was conducted in Australia, this programme played the same role?). The data projected by teachers on how they got involved in the PDP is worth taking note of. The fact that some were forced, others attended willingly and others were informed in different ways as projected in the diagram 4.9. Indicates that context did not play much role in the initial planning. Approaching the teachers involved and communicating programmes objectives and assessing individual needs would have been ideal for this programme, because the number of participants were not a large one. This process would have helped with need assessment. Additionally, Teachers expressed different understandings with regards to the programme coverage, indicating lack of effective communication of programmes' objectives and coverage to the participants. The preliminary meetings held during information sessions would have included teachers themselves, not the principals who did not attend the training. Teachers' response in "take-up" and "Nothing new" as themes that emerged in chapter 4 indicates that some teachers had the knowledge of environmental education in depth as they had qualification in EE, yet, a group of teachers also had no idea about EE. This understanding is vital in conceptualising, and planning of a programme like this one. Understanding the needs of teachers is vital to any type of professional development that we organise.

### 6.3 **The need for partnership in professional development within Environmental Education**

Partnership is also an important aspect in professional development. A healthy and informed partnership leads to a higher take up and greater implementation. Even though partnership was evidenced in the PD programme, there is an indication that the process of developing partnership was partial and not effective. Some partners were fully involved in the programme while others were passive. There was no contractual or regulations that were laid for the partnership. Partnership roles were stipulated among the partners in this PDP. The stakeholders were: PDP official, Education department officials and the teachers. In this partnership there were no distinct rules/regulations that were guiding the partnership. Moreover, partnership in this programme seemed to create a conflict in communication of roles, and what was expected of each partner. There was also a discord in the general objectives of this partnership. This in my view seemed to hinder the implementation, take-up and the PD processes.

Therefore, I present the process of this professional development in a very linked and a concrete manner- an interconnected way. That is to say, it is difficult to split discussions

about a PD programme from different role players and get the results that you want. The diagram below (diagram 6.1) then becomes very crucial in the way this PD was evaluated.

Each circle represents a particular activity as described by Tsui and Law (2005). The circle then represents the boundary. They however see boundaries as sources of potential difficulties, but also manifest potential in renewals and innovation. Boundaries oblige participants to take a fresh look at their long standing practices and assumptions and can be a source of deep learning. The core of this evaluation research was to formatively evaluate the professional development, take-up, and implementation of the PDP processes as they occurred within the boundaries of stakeholders within this specific professional development programme. I see the boundary crossings theory as referring to the learning, renewal and innovation that took place in the overlap/intersection that occurred between the activities of PDP officials, activities of teachers, and of Department officials.

The extent of professional development, take-up and implementation is necessitated by the activity theory that Tsui and Law (2005) see as a system which is driven by a motive; the motive of this PDP is to offer professional development to teachers in environmental education - the object of the programme. The activities of these stakeholders are driven by the goal to develop leading teachers in environmental education through a professional development programme which is directed by actions of the various stakeholders that were involved.

Tsui and Law (2005) postulate that activity systems are collective, goal driven, governed and mediated by rules; there is also a division of labour that is explicit and implicit to the organization of the community. The organisation mediates the transformation of the object of the activity system into the outcome. The organisational rules, help in enhancing and defining how participants are expected to behave and who is expected to do what in the achievement of the object of the activity system. These activities, I tried to illustrate in the diagram (6.1) below.
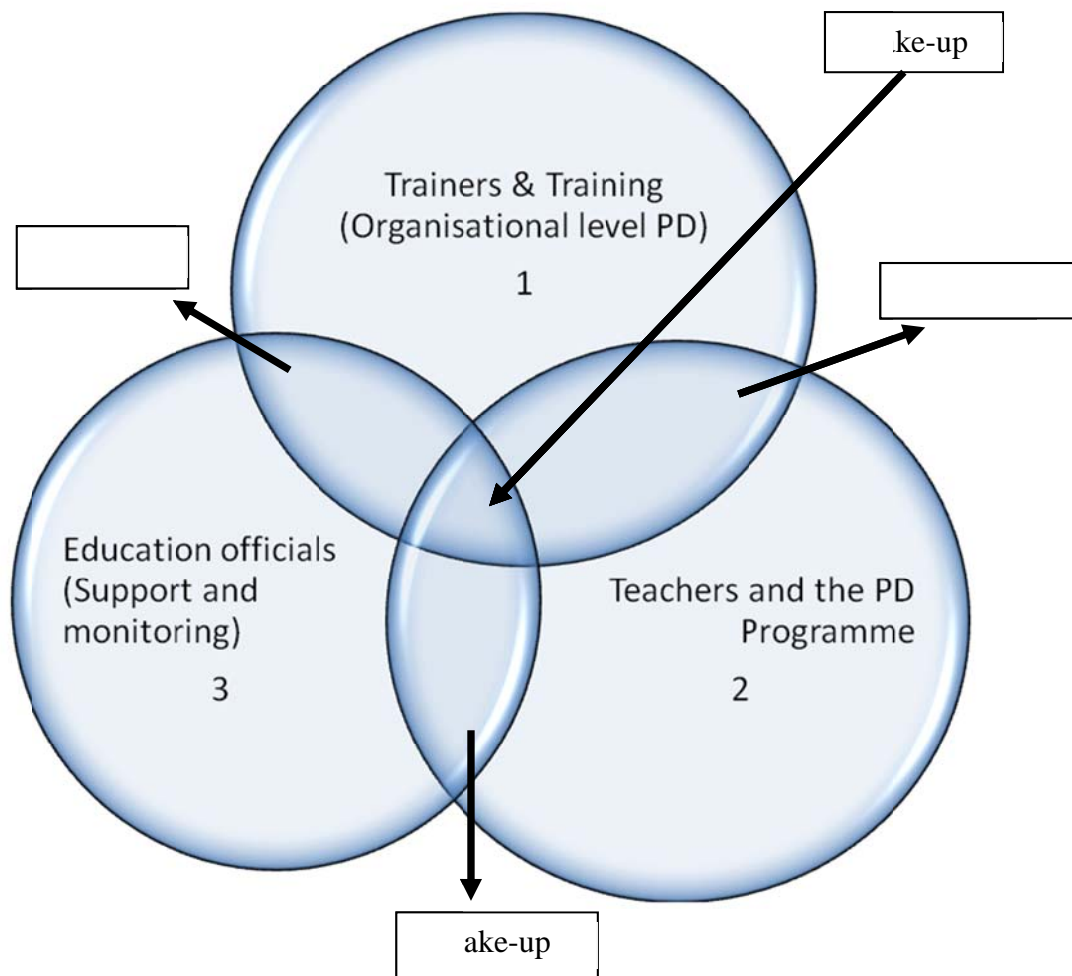
Diagram 6.1:  PDP take-up and professional development in EE

This diagram suggests therefore that the more actively each of the above stakeholders are involved in playing their role and understanding the objectives of a professional development programme that they engage in, the more the space (overlap)  for take-up and implementation are increased. Again the more they understand each other and embrace team work, commitment and understanding of the PDP, the more the spaces for take-up, implementation and degree of effectiveness of the PD increase.

The stakeholders in this programme need to develop more communication channels to improve team work; there also is a need for clarifying PDP objectives in order to secure greater participation. A monitoring tool should be implemented to hasten the implementation process. They need to submerge into each other, guided by the PDP goals and objectives to achieve better results.

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### 6.4 Significance of support and monitoring in professional development in Environmental Education

In the context of this programme, monitoring was seen as an intended outcome of the PDP that did not take place at all (reference to data analysis). This affected the intended goals for this programme. The ideal is that if the monitoring and support rendered to teachers during this PDP would have been reflected, there would have been a better take-up and implementation of the PDP, and teachers would have had a greater PD experience. The planning and conceptualization of partnership in support and monitoring in this programme lead to the failure of actual monitoring. This process demands careful selection, mentoring and monitoring to ensure integrity and commitment in the process.

Therefore, Support and monitoring emerge from this research as an approach to professional development that enhances and ensures the implementation and take-up in professional development. Lack of support and monitoring in teachers professional development hampers implementation and take-up. Therefore, monitoring the following areas would be essential to the improvement of implementation and take-up:

- evaluation to understand how the professional learning community or clusters of teachers are functioning;
- evaluation to ascertain how well the professional learning community and/ or teacher clusters or members are transferring their learning into their curriculum requirements, instruction, assessment of learners, action projects in local issues into their work environment; and
- evaluation to identify impact on student gains that accrue as a result of the staff's professional learning community and the workshop inputs and expectation of teachers work. (Hord and Sommers, 2008, p.114).

Even though this PDP had monitoring system in place through the Department of education officials, there was no clear indication of how the clusters they formed worked since teachers were chosen from different metropoles and this made collaboration and monitoring quite difficult. In establishing monitoring, an extent of commitment is needed to establish realization of monitoring goals. Clear goals and monitoring tools were lacking in this PDP as have been expressed earlier by department of education officials. Moreover, monitoring needs to be developed at each level, from the PDP officials and Education officials' level; from PDP and teacher's level and From Education department officials and teachers levels. The

possibilities of effective monitoring needs to be explored, as Education department officials expressed, their lack of monitoring to be due to the amount of workload that they had; lack of monitoring tool for some and lack of proper communication. I therefore suggest that the three areas mentioned above by Hord and Sommers (2008, p.114) are important elements that need to be integrated in the monitoring and evaluation of this programme if sustainability of the monitoring of the programme is to yield more take up and improved Professional development in Environmental Education at this PDP.

### 6.5 Suggestions

Suggestion at this point are made regarding, my further reading and surplus literature that revealed concepts and practical ideals that would help improve the context in which this PDP was conducted. I also perceive that these suggestions in addition to what the PDP had done would lead to even a greater take-up, better implementation and greater PD.

### 6.5.1 Suggesting Mentoring Alongside Workshop

In the analysis of the professional development; I understood that workshops were used as a main tool to professional development. To increase take-up, and to improve implementation of the professional development processes that this specific organisation had wanted to achieve, I suggest that this PDP adopt a more mentoring relationship alongside the workshops to enhance implementation. Mentoring is a complex entity (Kydd, Anderson & Newton, 2003, p.71). The question is can mentoring help as a developmental knowledge creating process, implementation enhancing take-up improving process in the complex environment where teachers work? They argue further that there are two parts of discourses to the notion of mentoring.

Firstly, the complexity at work, and secondly, what it means to an individual. They also speculate about the contributions mentoring can make in complex organisations where employees are part of the knowledge economy by virtue of being knowledge producers and being engaged in learning at work. The environment in which teachers work is becoming more and more complex and mentoring is also complex; therefore mentoring can help people to tolerate complexity and to remain effective. How? … "Mentoring is becoming increasingly employed in a range of occupational settings" (Kddy, Anderson & Newton, 2003, p.71).

The form mentoring takes is influenced by the mind-set management style and culture of the organisation. Paradoxically, it can be constructive and destructive, helpful and manipulative, confirm cultures and change them. Mentoring is about learning and learning is complex. And

it is associated with change. Mentoring also involves iterative learning, reflexive and reflective learning. These are essentials learning processes in a complex environment (Kddy, Anderson & Newton, 2003, p.75). I recommend that more research we done, within the context of this PDP to see how mentoring can become a tool to enhance workshops and improve take-up and implementation.

They simply put <u>complexity of mentoring</u> in this diagram:

```
                          ┌──────────────┐
                          │  Directive   │
                          └──────────────┘
                                 ↑
┌──────────────────┐                      ┌───────────────────┐
│  Coaching skills │                      │  Watching out for │
└──────────────────┘                      └───────────────────┘

┌────────────────┐      ←        →      ┌──────────────────┐
│  Work related  │                      │  Personal issues │
└────────────────┘                      └──────────────────┘

┌──────────────────────────┐      ┌────────────────────┐
│  Networking/facilitating │      │  Counselling skills│
└──────────────────────────┘      └────────────────────┘
                                 ↓
                          ┌──────────────┐
                          │ Non-directive│
                          └──────────────┘
```
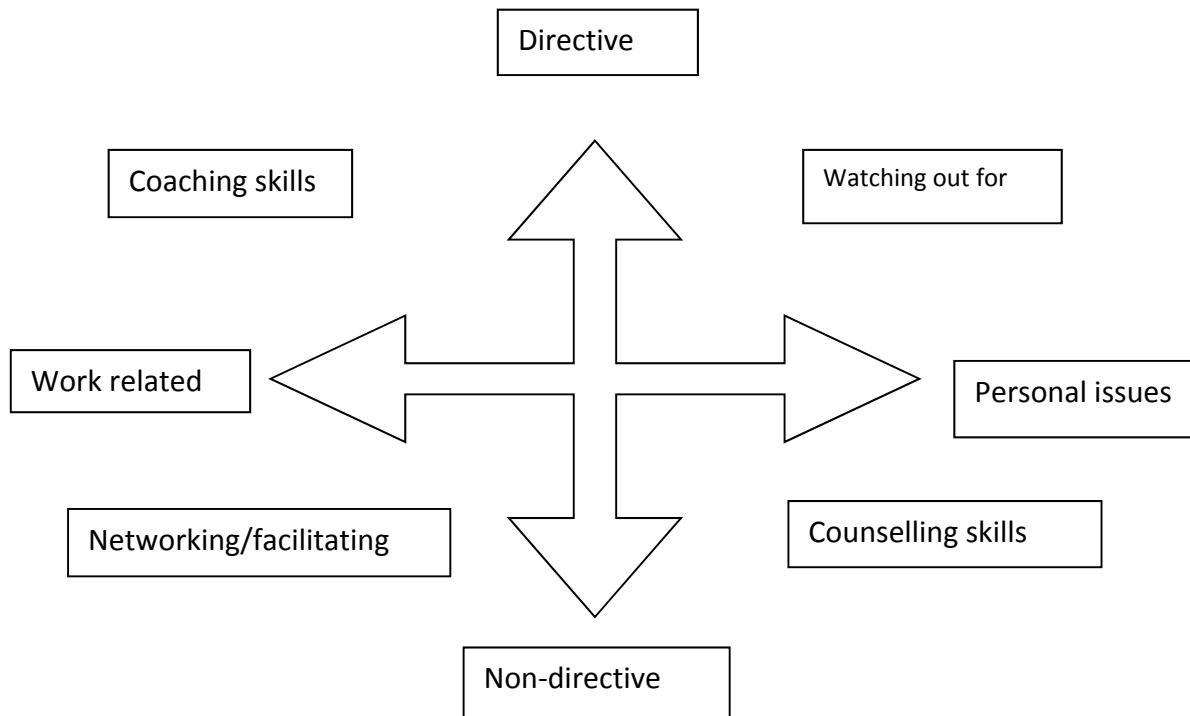
Diagram 6.2 Complexity of mentoring

(Kydd, Anderson and Newton, 1998)

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### 6.5.2 Motivation

Some teachers expressed disappointment coupled with lack of motivation. They mentioned that promises were made but never fulfilled. Some of them said that they were promised award certificates to show that they participated in this professional development programme but that did not happen and they felt that they had wasted their time. I may allocate this to a lack of motivation in the planning of the programme; this is because, if the programme was planned for three years, it is not clear what happened in the second and the third year. Respondents indicated that for them the workshops marked the end of the programme, meaning that they only knew about the workshops and that was it. Even though the two schools who completed their projects mentioned that the second year was meant for the projects, then what happened in the third year? When no monitoring happened, how would implementation of projects become a reality? A feedback session was planned where teachers would report and reflect on their progress, but this never happened, I was actually to observe these sessions but nothing really happened. Could it be that the planning and communication were not well done? Could it have been a leadership problem? A motivation problem? An attitude problem? It is a complex scenario.

It goes without saying that a workforce with low morale and self-esteem and few rewards will lack motivation. Thus, management of motivation is a key factor in successful leadership and people within an organisation whether people- or performance centred approaches are adopted. By understanding what motivates people and managing to achieve it, leaders and managers can enhance the performance of the people and teams in the organisation. Several theories have been described as to how motivation works but this will not form part of this discussion. The underlying factor is that motivated participants or team spirit works better and produces desired results, and the opposite is also true. Further research, on how to motivate, support and monitor teachers within this PDP will enhance implementation of PDP intended outcomes and objective.

### 6.5.3 Creation of realistic action projects in Environmental Education programmes

The programme theory as seen in this programme requires that realistic goals that the programme can implement monitor and achieve be reconceptualised. If the goals are too ambitious or not achievable, then the programme theory needs to be revisited in order to be able to achieve desired goals. The action projects needs to be revisited and action competence need to form an aspect of this training in order to lead to the action projects. These goals need to be revised through need assessment to meet the target needs of individual teacher. The teachers who were involved in this programme were a manageable number and individual professional needs with regard to environmental education and integration of life sciences would have enhance take-up and implementation. This was evident in the discord of responses that teachers gave regarding their entire outlook of the programme.

In the same vein, Jensen and Schnack (1997, p.164) put it that "the fundamental assumption is that environmental problems are structurally anchored in society and our ways of living. For this reason it is necessary to find solutions to these problems through changes at both the societal and the individual levels. This is why the aim of environmental education must be to make present and future citizens capable of acting on a societal as well as a personal level. This assumption has many consequences for the objectives, content and processes of Environmental Education". Based on this premise, they argue that action competence has been considered by many as a technical approach to EE and summon that action competence should be embraced or "understood in the educational concept and in the basis of scepticism in the face of whole educational paradigm" (Jensen and Schnack, 1997, p.165).

They note further that it is not and cannot be the task of the school to solve the political problems of society, but that student activities should be assessed with regard to their educational value. Additionally, concerns about the environment, health and peace must be coupled with a corresponding concern for democracy. Thus, action competence is a developmental ideal, "a formative ideal" in a democratic approach to education. Thus competence is associated with being able and willing to be a qualified participant. How this programme did this needs to be clearer, as it was not.

From the foregoing, therefore, action projects should form part of environmental education and should be seen in their educational value and in the democratic nature of education. However, the action projects should be geared towards the context in which the teachers work and should be assessed to the existing curriculum that is available for the teachers to use.

Otherwise teachers will begin to see EE as an outside thing that interferes with their work. The action projects should be achievable and implementable within the school culture and routine, as the context of the South African curriculum demands.

### 6.5.4 Importance of recognizing teachers' learning in planning and conceptualizing professional development in Environmental Education

Knowing how teachers learn is an important factor that helps PD providers with ideas of how to plan, conceptualize and theorize PD programmes. Knowledge of how teachers learn would help this PD in planning the various approaches to PD that would suit the specific teachers that they invited to the PDP. Knowing their prior knowledge and how they acquire knowledge generally would have enhanced them in choosing better forms of activity, enough time for teachers to learn, and form collaborative synergy groups that would enhance better learning at the PDP. Teachers' attitudes also are an important aspect that would inform the programme theory.

Chi-Kin Lee (2000, p.96) postulates that the propensity for adopting Environmental Education depends on teachers' attitudes towards or receptivity to the curriculum innovation. Although positive attitudes towards a curriculum innovation may not be an accurate predictor of implementation of an innovation, teachers' attitudes can be crucial in determining the success and failure of an innovation. In the same vein, I urge that this PDP needs to inculcate an attitudinal dimension in their training to enhance implementation and take-up from the PDP processes that they engage teachers in.

Teachers' receptivity of change may affect the implementation and take-up in professional development. Thus Chin-Kin Lee, though writing from a Hong Kong perspective, brings into reality what is obtainable in South Africa. Her views depict research findings with regards to teachers' attitudes and how this affected the implementation of professional development in EE programmes (refer to chapter four data analysis on teachers' attitudes as a theme). Chin-Kin Lee points out the following on teachers' receptivity to change and provides empirical support that the following affects teachers' learning and how they will perceive, learn, or implement EE processes:

- Beliefs on general issues of education;
- Overall feelings towards the previous educational system;
- Attitude toward the previous educational system;
- Alleviation of fears and uncertainty associated with the change;

- Practicality of a new educational system in the classroom;

- Perceived expectations and beliefs about some important aspects of new educational system;

- Perceived support for teacher roles at school in respect to the main referent of the new educational system;

- Personal cost-appraisal of the change and beliefs on some important aspects of the new educational system in comparison with the previous one.

(Chin-Kin Lee, 2002, pp.96-97)

For environmental education programme developers to be successful in their endeavour to develop teachers these and more need attention in curriculum planning, i.e. instruction and implementation of PD programme objectives.

Reis and Roth, (2007 p.307), emphasize that in the educational arena, environmental educators have the potential to influence the knowledge of future generations about the weather and the environment in general by designing an appropriate curriculum. Cognisance of teachers' previous knowledge on the subject being taught also calls for attention; otherwise the content might render redundancies and a repetition of what the teachers already know. This was depicted from the respondents. Knowledge of the curriculum should be built on objectives which grew out of identified learning needs, and if the strategy is an outgrowth of the curriculum, then strategy will coherently reflect the needs of teachers as learners. It is for this reason that evaluation and feedback should occur at each step in training design rather than solely at end of the process;  in some cases this is not part of it at all (Bell and October, 1977, p.4).

More research on teachers learning is needed in order to enhance curriculum planning and implementation as used in Professional Development programmes in EE. I recommend further research, on teachers learning within this PD in order to improve the Programme theory in this specific PD.

### 6.5.5    Concluding comments/remarks

From this research, therefore, it is clear, that the way professional development works, entirely depends on the various stakeholders involved. The success of a Professional Development Programme depends on the roles played by the various stake holders involved. Stakeholders include those with invested interest in the professional development programme that is envisioned.

Environmental Education and professional development programmes that are organised for public schools and teachers using a common curriculum demand that the planning of the professional development be developed in line with the curriculum requirements if an implementation of PDP objectives is to be realised. Programme theory is crucial in running a PD programme as this acts as the engine of the entire PD programme. The conceptualisation of the programme and its aims and objectives should be based on a constructive critical paradigm in order to consider the action competencies that environmental education demands.

Partnership is a crucial entity when venturing into professional development. The kinds of partnership, be it financial partnership, academic and research partnership, support partnership, participants' partnership and any other form of partnership are crucial. The kind of partners one involves in the education process should have invested interest in environmental education; otherwise it renders null the objectives of environmental education.

It is noteworthy from this programme that in an environmental education programme, take-up, implementation and an increased level of professional development are crucial aspects of programme evaluation. However, partnerships in the education process need to be informed and carefully chosen to strengthen the sustainability of a programme. Like seen in this programme, the activities of the PDP officials, department of education officials and teachers have some resultant take-up, an amount of implementation and a degree of professional development as expressed by teachers.

The implementation of the programme is seen as partially achieved by the PDP officials. This is evident in the way they had planned the programme as discussed earlier and the how the programme actually took place. They had some percentage of implementation even though not all their intentions were achieved; again the department of education officials performed some of their roles as indicated by the Programme theory in terms of selection, and ensuring that the programme meets the curriculum requirements, but failed in their task of monitoring

teachers' projects and rendering support to them; to me; this contributed to the only partial implementation of the action projects.

Similarly teachers had their roles as participants in the PD programme and this enabled them to come to the workshops to listen, participate actively and generate the kind of take-up that they gained from the PD programme; but they also failed in some way by not attending regularly and giving excuses; some did implement projects, others did not plan or put into action the projects that which they were supposed to put in place. In this manner we see that the active participation of every partner in a given environmental education PDP yields results depending on the efforts every member put in. Again embracing team work, motivation, commitment and trust go a long way in yielding results.

Monitoring and support are crucial elements that improves the way programmes run. Lack of adequate support and monitoring in this PDP led to minimal take-up and implementation of action projects. Daisy, one of the participants solicited support in the implementation of the projects and requested that the PD programme officials be part of that support system. She was ready and willing to work with the project managers as the departmental officials have not been able to give any support.

I therefore conclude that this PDP programme is a potentially useful professional development programme for teachers in environmental education and has space for improvement. Some of the above suggestions developed from the findings can assist with improvement. However, more research is needed to put in place better professional development programmes that would assist teachers in better teaching of EE.

I also looked at leadership issues as playing very important role in enhancing professional development. Leadership influences the implementation of PD programmes. Leaders are path-finders who give the vision, direction, order, discipline and mission for the PD programme. It is where the leaders lead that the rest follow. Thus, leadership should embrace teamwork and motivation of the people he or she is leading to where he/she wants them to go. Thus, leadership in this programme has led it to be where it is this far, and a focus area of leadership can further improve such a programme.

### 6.5.6   Reflection and reflexivity

The research journey has been an enriching one. I have learned extensively in the field of evaluation research: interpretive epistemology as a paradigm in research, how programme run, theoretical underpinnings and practical aspects of programme, idealism and realism of

programme operations. I have also learned to an extent the core indicators of programme effectiveness and the importance, coverage and concerns of environmental education.

Generally I have explored the pedagogical implications of environmental education and its implications to the kind of teachers we engage in professional development for improved quality of teaching and learning. This research also contributes to a large extent to life science and environmental integration in teacher education; and thus to an expansion of curriculum studies. It also opened my eyes to the complexities that exist in environmental education as a field and in professional development and teacher Education.

Methodologically, I can say that this research has achieved its objectives of evaluating formally, this specific PDP programme. Finally, I wish to assert, that this PDP is a potential partner in knowledge building in raising environmentally literate educators. There is room for improvement and opportunities for more sustainability and thus better opportunities for uptake from the programme. The recommended changes I believe need to be implemented in the programme through mutual communication of findings through report writings, meetings, seminars and round table discussions.

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# Appendix 1:
# Ethical clearance, Stellenbosch University

**UNIVERSITEIT·STELLENBOSCH·UNIVERSITY**
jou kennisvennoot • your knowledge partner

15 July 2010

Tel.: 021 - 808-9183
Enquiries: Sidney Engelbrecht
Email: sidney@sun.ac.za

Reference No. 324/2010

Mrs JA Chiroma
Department of Curriculum Studies
University of Stellenbosch
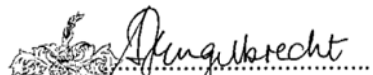**STELLENBOSCH**
7602

Mrs JA Chiroma

## APPLICATION FOR ETHICAL CLEARANCE

With regards to your application, I would like to inform you that the project, *An evaluation of professional development programme in Environmental education,* has been approved on condition that:

1. The researcher/s remain within the procedures and protocols indicated in the proposal;
2. The researcher/s stay within the boundaries of applicable national legislation, institutional guidelines, and applicable standards of scientific rigor that are followed within this field of study and that
3. Any substantive changes to this research project should be brought to the attention of the Ethics Committee with a view to obtain ethical clearance for it.

We wish you success with your research activities.

Best regards

**MR SF ENGELBRECHT**
**Secretary: Research Ethics Committee: Human Research (Non-Health)**

Afdeling: Navorsing en Innovasie • Division: Research and Innovation
Privaat Sak/Private Bag X1 • Matieland 7602 • Suid-Afrika/South Africa
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# Appendix 2:
# Interview questions.

**PDP officials (trainers):**

- Describe your experience in the curriculum process and conceptualization of PDP's professional development programme so far?

- Based on your experience, discuss how you go about your professional development in this programme?

- Tell how you ascertain/establish acquisition of intended skills and knowledge of participants as Environmental Educators in life science Teachers?

- Discuss some of the challenges you face as trainers in this PD programme?

- What support do you render to the teachers with regard to application of what they have acquired at the PDP and the implementation in practice?

- How will you describe participants' attendances?

- Do you have any suggestions that might help improve the training, take-up and implementation of the PD?

**Participants (teachers)**

- Discuss your involvement with this specific PDP?

- What did you learn at the PDP that is different from your initial teacher training?

- How are you putting what you learned through this process into Practice?

- What further support do you get in implementation process?

- What would you like to see done differently in order to improve your professional development in the future?

**Department of Education Officials:**

- Please describe your roles with regard to EE and life sciences integration?

- Discuss your involvement with this specific PDP's professional development programme of the FET teachers in life sciences?

- Relate the kind of support and follow-up activities you give to ensure take- up and implementation of the PD programme at this specific PDP?

- Validate this PDP as an intervention in professional development of environmental educators? Have you been through the training yourself?

- What suggestions will you render in order to improve the take-up and implementation of the PDP's PD programme?

**General biographical questions**

- How long have you been in the teaching profession?
- What is your highest qualification and where did you attain it?
- When were you trained as a teacher in this learning area?
- Have you received any OBE training and for how long?
- How long are you teaching this learning area? / How long have you been involved in the PDP's programme?
- Which other learning areas do you teach?
- How long are you familiar with the concept Environmental Education? Did you have any training of this nature before coming to this PDP?
- How long has the concept of environmental education formed part of your teaching?

# Appendix 3:
# Letter of Informed Consent



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STELLENBOSCH UNIVERSITY

CONSENT TO PARTICIPATE IN RESEARCH

AN EVALUATION OF A PROFESSIONAL DEVELOPMENT PROGRAMME IN ENVIRONMENTAL EDUCATION

You are asked to participate in a research study conducted by Jane Adhiambo Chiroma from the faculty of education, curriculum studies department at Stellenbosch University. This research will be a contribution towards my Masters of Education in Curriculum studies (MED Curriculum Studies). You were selected as a possible participant in this study because you are one of the teachers/an official/a trainer/manager in this professional development programme that is offered by this PDP. Your participation in this study will allow me to gather the needed data to evaluate the professional development programme for this PDP[40] in order to improve the sustainability of the programme.

PURPOSE OF THE STUDY

This research intends to conduct a formal evaluation to determine the extent of professional development of teachers in environmental education at the PDP for FET life science teachers programme, take-up of environmental education processes and the implementation thereof.

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[40] Name changed for ethical reasons for presentation in this thesis.

PROCEDURES

If you volunteer to participate in this study, we would ask you to do the following things:

You will be asked to respond to open ended questions and follow up questions to your responses in an interview format.

Participate freely in expressing your opinions.

Maintain confidentiality.

Respect other people's opinions.

The results of the interview will be audio recorded and written notes will be taken by the researcher.

You will also be required to participate in a focus group discussion with some of the teachers/ SANBI officials or with Curriculum Advisors when necessary, which will last one and half hours.

These will be studied and used as the basis of a research report.

The interview should not take more than an hour.

POTENTIAL RISKS AND DISCOMFORTS

There will be no physical risks at any time. You may choose to either now or at any time during the study to withdraw your participation. There will be no penalty or loss of benefits. I have no interests in knowing how a specific individual responds to the interview questions. All information gathered will be held in strictest confidence and you are guaranteed complete anonymity.

POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY

The data from this study will lead to the improvement of the professional development programme in Environmental Education at this specific PDP and its sustainability. This research will also open a window for more research in the field of professional development of EE educators in order to strengthen this sector of curriculum. This research will also contribute to the department of curriculum studies in the field of environmental education.

PAYMENT FOR PARTICIPATION

There will be no payments involved in the process of the interviews. Light refreshment will be provided during the cause of participation of this study. In case one has to travel for more than 20 km for the interviews travelling expenses will be covered at the end of every interview sessions.

CONFIDENTIALITY

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission or as required by law. Confidentiality will be maintained by means of anonymity since the research report will represent composites of the important results of the interviews and names will be changed, and if, specific references are made. All records related to the interviews and this research will be kept in a safe place. The results of this research will not be used in any way for performance appraisals or disciplinary procedure.

The interviews will be audio recorded, and the participants will be given opportunity to review and edit the recordings. The recordings will be used by the researcher for analysis of data. The records will be kept safe at the EEPUS office until the study is completed.

PARTICIPATION AND WITHDRAWAL

You can choose whether to be in this study or not.  If you volunteer to be in this study, you may withdraw at any time without consequences of any kind.  You may also refuse to answer any questions you don't want to answer and still remain in the study. The investigator may withdraw you from this research if circumstances arise which warrant doing so.

IDENTIFICATION OF INVESTIGATORS

If you have any questions or concerns about the research, please feel free to contact Jane Adhiambo Chiroma (principle Investigator) on 0218082288,(EEPUS office) or 0795536895 (Cell number); # 6 Merriman Avenue (residential address) or Prof. Chris Reddy (Supervisor) : 0218082259(office); 0827711923 (cell); 0218082295 (Fax); university of Department curriculum studies, Ryneveld Street.

RIGHTS OF RESEARCH SUBJECTS

You may withdraw your consent at any time and discontinue participation without penalty. You are not waiving any legal claims, rights or remedies because of your participation in this research study.  If you have questions regarding your rights as a research subject, contact Ms Maléne Fouché [mfouche@sun.ac.za; 021 808 4622] at the Division for Research Development.

| SIGNATURE OF RESEARCH SUBJECT OR LEGAL REPRESENTATIVE |
|---|

The information above was described to [me/the subject/the participant] by [name of relevant person] in [Afrikaans/English/Xhosa/other] and [I am/the subject is/the participant is]  in command of this language or it was satisfactorily translated to [me/him/her].   [I/the participant/the subject] was given the opportunity to ask questions and these questions were answered to [my/his/her] satisfaction.

I hereby consent voluntarily to participate in this study/I hereby consent that the subject/participant may participate in this study. I have been given a copy of this form.

_____

Name of Subject/Participant

_____

Name of Legal Representative (if applicable)

_____          _____

Signature of Subject/Participant or Legal Representative          Date

| SIGNATURE OF INVESTIGATOR |
|---|

I declare that I explained the information given in this document to _____ [*name of the subject/participant]* and/or [his/her] representative _____ [*name of the representative]. [H*e/she] was encouraged and given ample time to ask me any questions. This conversation was conducted in [*Afrikaans/*English/*Xhosa/*Other*] and [*no translator was used/this conversation was translated into* _____ by _____].

_____          _____

Signature of Investigator                                    Date

# Appendix 4:
# Interview Schedule:

| NAME OF THE RESPONDENT | MONTH OF THE INTERVIEW | TIME OF INTERVIEW | NATURE OF INTERVIEW |
|---|---|---|---|
| Hamisi | August 2010 | 1400hrs | Semi-structured interview |
| Eucalyptus and Daisy | August 2010 | 1400hrs | Focus group interview |
| Sisal | August 2010 | 1030hrs: 1130hrs | Semi-structured interview |
| Kasuku | July 2010 | 1430hrs:1530hrs | Semi-structured interview |
| Betty & Achieng | July 2010 | 930hrs: 1130hrs | Focus group interview |
| Cyprus | July 2010 | 1430hrs:1530hrs | Semi-structured interview |
| Peter | July 2010 | 1000hrs:1100hrs | Semi-structured interview |
| Cactus & Lavender | July 2010 | 1430hrs:1630hrs | Focus group interview |
| Pansies | July  2010 | 1100hrs:1200hrs | Semi-structured interview |
| Rose | July 2010 | 1035hrs: 1135hrs | Semi-structured interview |

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# Appendix 5: Biographical Data

| Respondents | Duration in teaching profession | Highest qualification | Year of training as a teacher | Training in OBE | Areas of interest | familiarity with the concept EE | Duration involved in the PDP |
|---|---|---|---|---|---|---|---|
| Rose | 30 years | Bsc | 1979 | 2005(cascade for 2 weeks) | Life science | 30 years as zoology | 1 year |
| Kasuku | 32 | Med, Msc. | 1977 | No official programme | Biology-Ecology | Formal masters has formed part of his teaching | Since inception in 2007 |
| Peter | 14 | BA. Degree and HDE | | Non | Natural Science | 4 years in relation to teaching life science and natural science | 1 year |
| Eucalyptus | 14 | HDE | - | Yes, three weeks | Mathematics | From the beginning, was taught at School | 1 year |
| Hamisi | 26 | Med | | Yes, as a trainer but not as a teacher. | Technology | 8 years | 2yrs |
| Sisal | 2 years | Bed. Hons | 4 years ago | Yes, a year | Life Science | 9 years | 3 years |
| Cyprus | 1989 | Bsc | 2003 | Yes, 1 year | Natural Science | 5years | 3 years |
| Pansies | Three and half years | Bed | Three and half years | Yes, 4 years | Mathematics and Mathematical literacy | 6 years from tertiary institution | 3 years |

| Cactus | 24 years | Bed | | Yes, 2-3 days course | - | 7 years Since the inception of the New curriculum | 3 years |
|--------|----------|-----|--|---------------------|---|--------------------------------------------------|---------|
| Lavender | 15 years | BSc | 1994 | Yes, 3 day course | Mathematical literacy/ Natural sciences | 15 years, no formal training in EE | 3years Since 2008 |

# Appendix 6:
## Data Coding Process (partially presented)

| Transcription of data | Level one coding | Coding and Identification of themes |
|---|---|---|
| I =Interviewer<br><br>R =response<br><br>I:	I'm very happy that you agreed to be part of this research.  I indicated that I need a formal evaluation for improvement, for improvement of the PD programme – Please describe your roles with regards to integration.<br><br>R:	I need to say that my involvement with with this PDP has been a long standing partnership.<br><br>This is important to understand that there is a social history between the individuals at Kirst garden and myself.  Both Achieng  and Ngugi they were Biology head of departments at two schools of which I was the Curriculum Advisor.  In other words my relationship with Achieng started when I started as a Curriculum Advisor and that was in 1998, the first of June.<br><br>So I know Achieng from then she was the HED for Biology.  Ngugi I know much longer.<br><br>In 1992 I started my M-ED in Environmental Education at university R[41].  At that stage I was at a high school and I work with a number of teachers in research and Ngugi was one of them.  So I think that is important in partnerships that one you have a relationship. You need to have that to have a partnership Programme. | He has a long standing Partnership.<br><br>Has a long Standing relationship with the staff at PDP<br><br>Both head of departments at two schools where he was an advisor.<br><br>He is trained in Environmental Education. | Partnership: important aspect of partnership that is productive.<br><br>The challenges of partnership and how this might affect a given PD programme.<br><br>- Visionary<br><br>-educational background in EE |

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[41] Name changed for confidentiality.

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| That makes the quality of the partnership because we have a long standing relationship[…] | The quality of partnership is enriched by long standing relationship they've heard. | -variety of gifting needed |
| We understand each other, we have a common educational vision.., and that, I think, enriches that. I also need to say that I worked in the district's Office which is unique in anyways and mustn't be seen as a typical official education department that can do this. | They both have a common educational vision. | - mutual relationship and familiarity within partners |
| My interest in Environmental Education also comes along for a very, very long; being involved at different levels – international, national, provincial, local... I've been involved at all those levels. | He has a passion and interest in environmental education hastened by his involvement in international, national and provincial and local levels. | -common passion and commitment to the PD. |
| So, me meeting up with Ngugi and Achieng was part of my involvement in the community of Environmental Educators. I was asked to be seconded in 1998 to the department. | His involvement with PDP is part of community of Environmental educators. | - experience and involvement |
| That was one of the pot holes that I took on unofficially. In the an Education district it is officially/unofficially considered that I am the Environmental Education Coordinator. | Also involved with another organisation: Cape nature. | Roles played by the educational officials in ensuring the Programme is Running: |
| I give an example: my immediate superiors having a meeting on the, I think it is the 16th of July, with a nature reserve to relook at our relationship with them. I must be in that meeting. | | - A Curriculum Adviser. |
| Everything that has to do with Environmental Education (unclear) would want me to be in there so that I can make a decision. I need to say that also clearly. | Has been involved in the education department in many areas and partnerships as Environmental education is concerned. | - A research expert<br><br>- consultant<br><br>- A partner |
| I'm in a unique situation that I'm considered to be the Environmental Education coordinator. No other district in the WCED, Western Cape Education Department, has a position officially or unofficially. Because of my on-going relationship with Achieng and Ngugi their involvement in Teacher Professional Development in the field of Environmental Education is very important for me as a partner. | Sees himself as a partner with the PDP especially in the Western Cape Education Department. | - A participant at the workshops.<br><br>- Selecting teachers who would then participate in the programme.<br><br>- Support and monitoring responsibility. |

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| Keeping in mind as an Official I have a lot of responsibilities and Environmental Education is an additional responsibilities. | Sees Environmental education as an added responsibility to the many responsibilities that he already has. | - Link for teachers between PDP and the Department of Education.<br><br>- Creator of awareness on available PD opportunities in the district. |
| So although I might have an understanding of Environmental Education, I might have the passion, but I don't have the time to teach Professional Development in Environmental Education. Consequently I have partnerships with organisations there (word unclear) to the actual work. And this is the relationship with this PDP. | He does have the passion to teach EE but does not have the time to do it that is why he values the partnership that he would get from other organisations like this PDP. | |
| So, how did this process start? Also I am, at that stage, I was the Life Science's Curriculum Advisor for FET, Further Education Training Sector that is Grade 11 and 12. | He is the curriculum Advisor for FET for grade 11 and 12. | |
| It was me and Ngugi, and Achieng who brainstormed this this programme because Harambee was interested in funding an FET[42] programme. | From this position they brainstormed with the PDP officials to begin this programme because Harambee was interested in funding the programme. | |
| Consequently the three of us sat down and and we looked at putting together a proposal to present to Harambee [43]to fund. | They sat down (3 persons) to put together a proposal to present to Harambee. | |
| My role was to bring to bear my understandings of theories of Teacher Professional Development. So therefore, number 1, it had to at least be a 3-year programme. | | Collaboration in programme theory |
| It was a process of working with the same teachers for 3 years, but in addition was working with the same learners for 3 years, as from Grade 10, to grade 11 to Grade 12. | His role was to bring his understanding of theories of Teacher professional Development. | |
| To a large extent I used my research work and the theories that I working with and new ideas that emerged to form this process. | They decided that the programme would run for 3 years while working with the same teachers and the same learners' from grade 10 to 12. | |

[42] Further education and training
[43] Pseudo name

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| So my role was to a large extent in the initial stages as a research consultant; looking at the proposal and making sure that it is academically rigorous. It was a nice synergy because Achieng knows the practical issues about teaching Professional Development.<br><br>Ngugi also knows what is possible because Ngugi had a close relationship with Harambee. Through this process also we incorporated the now director of Harambee who at that stage was not in that position, to advise us what is possible and what is not. | This came as a result of his research work.<br><br>He also acted as a research consultant who was making sure that the proposal was academically rigorous. This gave him the synergy because the other partner was more gifted in practical issues in teaching profession.<br><br>The third partner was more into funding and had a close relationship with the funders. | |
| That is also a nice area of what should be the relationship between a Teacher Professional Development Unit and a proposable funder. Very much we had an on-going meeting with the director of Harambee[44] who was at that stage the head of Harambee. Obviously he stepped down and this new person took over. No, Harambee have been involved in formulating the proposal with Achieng [45]and Ngugi[46]. Being involved with meeting with Achieng, Ngugi and myself, funder Harambee, a number of meetings.<br><br>My other role was also to, when possible, to be at the workshops itself.<br><br>Not to present, but to be there. I was also involved in selecting the teachers that were involved in this programme.<br><br>The idea here is this, as a Curriculum Advisor I could be the sustainable support system at school. Even in reality it never works smoothly. Keeping in mind, I got a number of responsibilities and in theory as clean and simple as it might seen, these are schools in | The funders were also involved in the formulation of the proposal, despite change of leadership that occurred within this process.<br><br>His other role was to be at the Workshops when possible.<br><br>He was also involved in selecting the teachers that were involved in the programme within his District. | |

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[44] pseudonym

[45] pseudonym

[46] pseudonym

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| my district so I can go and visit them. Unfortunately my job doesn't speak that way.<br><br>The schools that I need to visit are desired for me due to crisis issues and stuff. So I think that's one of the challenges. Also we work with two districts, our district and another district X[47] which includes the huge area Mathare[48] and the reason for that was that the previous (word unclear) in that country spoke about poverty in the province.<br><br>There were three designated areas that people have to work in –Mathare[49] and Kibwezi[50] – the two most poverty stricken areas. Consequently Mathare that is another district. There we in a very importantly attracted Biology curriculum advisor. But because he doesn't have EE in his blood, he is not passionate about it, he slowly but surely dropt of the bus and that is part of the challenge. Although Environment is in the curriculum of the Life Sciences if people don't have the passion for it, they will not see the need for it and I thing that is the lesson that we've learned there.<br><br><br><br>My continuing involvement was with an evaluating process with Achieng. We also, the two of us, selected the teacher that went to Canada that go and present the project at the World Environmental Congress. To a large extend I continued to have meetings with Achieng when managers that they to the running of the project. So I've got, one, that I think I know EE, I think I know Teacher Professional Development, but the other more important, I'm the official in the department that can go to school. I can speak to principals to tell them if you are lucky I will bring this project to your school. | Acknowledges his role as a sustainable support system for teachers at school which never happened in reality. Due to the many responsibilities that they do have.<br><br>He admits that he has the mandate and permissions to visit the schools but the responsibilities are enormous.<br><br>**Challenges of implementation**: poverty stricken areas attracted a need for a Biology curriculum advisor of who is not Environmentally compliant, and is not passionate about it and dropped out along the way.<br><br>He utters that even though EE has a place in the curriculum if people involved in it do not have the passion; practice becomes difficult and is neglected.<br><br>They were at the verge of wanting to evaluate the programme.<br><br>They also selected the teacher who when to present a project in the World Environmental Congress. | Challenges of Implementation:<br><br>-Time<br><br>- Workload<br><br>- Poverty<br><br>- Difficulty in practice and theory.<br><br>-Lack of passion and commitment<br><br>-Lack of expertise in Environmental education amongst teachers and other Curriculum Advisors<br><br>-Lack of conducive atmosphere at the department to carry out "extra" responsibilities |

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[47] pseudonym

[48] pseudonym

[49] pseudonym

[50] pseudonym

That is what was going to be needed to be successful to a large extend to ensure that the management of the school supports the project that the teachers are involved in.

What I also did, I'm involved in an international project called Global Environmental Teaching, with the University of (Name unclear.) This is an exchange programme with teachers moving. Last year they were here (part unclear) but then I ensured that the number of these teachers that's part of this FET-programme was also on that programme.

My role is to create extra opportunities for these teachers to be involved in different Environmental Education Process to deepen their understanding. The last one I want to add, some of these teachers that's part of it, I was also involved in making sure that they continue their studies. There is a boy, and there is this other gentleman also. This is some of the roles that I've been involved with. I think that's about it. Have you been through the training yourself?

I:      No, I just wanted to ask a little bit about your involvement and your roles. So in your selection of the teachers which criteria's do you use?

R:      Okay, first of all I need to look at, I will give you my criteria as an official. Number one the teachers that I select must be at the school that is stable. Let me explained that: 80% of the schools in the country are dysfunctional. So you don't involve yourself with a school where the school management don't know where their head and toes are. The chances are that blossoming at the school is zero. There must be a supportive school management team that is functioning well at the school.

He also played the role of creating awareness of the programme in the schools through the school management.

He also ensured continuity of PD by recommending teacher who were part of the PDP programme to attend other international EE programmes organised in SA.

Thus he created extra opportunities for teachers to deepen their understanding of EE.

Criteria of selecting teachers to the programme Education department official perspective:

Teachers must be at stable schools.

The schools must be school with stable management team that is functioning well at the school.

*Rhyzom*e: Needed and evaluation of the Programme.

Criteria of teacher selection as participants in the Programme:

| | | |
|---|---|---|
| The second thing: The teachers must have an interest and a passion for Environmental Education. How do I find that out? I look at their track record.<br><br>Look, I'm involved in Environmental Education for decades and decades and decades. So to a large extend I know most of the teachers that's been involved in various EE projects. I also have links with other Environmental Education Organisations, government and non government. I will phone and say, are there any teachers that you recommend for a project? This is what the project is all about. So there is a type of consultation. The teacher must be passionate about doing this. Where possible I also look at, at least two teachers at a school. That is sustainable when two people at the same school can talk to each other and supporting each other. And then obviously my personal knowledge of the individual is important. With me being a Curriculum Advisor I would know and I will have some insights in to the person I would helping. Is person a dedicated teacher, is he interested in children, is he/she interested in learning? Etc, etc. Then obviously we need to look at demographics, we need to look at which schools we are interacting with, to see if there is a spread. But for me the most important criteria would be the stability of the school and the track record of the individual. Those are some of the criteria that I use.<br><br>I: So have you been through the training yourself?<br><br>R: Also yes and no. Unfortunately I would sit in on workshops. The first couple of workshops I actually was there all the time. I was not an active participant.<br><br>I: So discuss your involvement with the this specific Professional development Programme. | The teachers must have interest and a passion for EE – he determined this through their track records.<br><br>From his long experience and involvement in EE he is able to tell which teachers are right for this training.<br><br><br><br><br><br>He looks at individual teacher's capacity and interest in learning, and teaching children.<br><br>His role in supporting of the teachers should be institutionalizing the research projects that the teacher do.<br><br>Sat in workshops but was not an active participant. | Criteria of teacher selection as participants in the Programme: |

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| | |
|---|---|
| R: I would say I'm a non-participant as far as that concern. I was not a presenter at all in the programme. Achieng and the PDP staff did all the facilitation of the process. I was there, like I said, an initial formulating the proposal in meetings. I would be there as far as evaluation session with Ngugi and Achieng regarding the programme. But actually participating as a presenter, no. | He is a non-participant as far as PDP is concerned. Was not presenter at all in the programme.<br><br>Was there at the beginning of the program proposal formulation.<br><br>I would also be there as far as evaluation sessions with the director of the programme. |
| I: So once you've selected the teachers and they go there what kind of support and formal activities do you provide? | |
| R: As far as those individuals are concerned, my support is that the project that they're doing I will except as a research project of the Grade 10 or this year, Grade 11 research project for their Life Science's year mark. So in other word, I play the role of supporting teachers to institutionalise this research project. Very important, Grade 10 and Grade 11, they have seven items for assessment which is then used to calculate the year mark and a research project is one of them. And very important, we expect a research project to follow the scientific investigation process. That is where I play a role – making sure that the research project itself, meets the requirements and is actually is excepted as a research project. | He calculate year Marks including the research project which they require to follow a scientific investigation process. So he ensures that the projects meet up with the requirements of a research project.<br><br>He is not sure on the kind of support he has been able to accord teachers but recognises that support is essential to any PD programme to be implemented. |
| I: Okay, so with regards to PDP once they have done training at PDP then they go back in to the schools? What support like, okay, you said you help them with their projects (Part of question unclear) So how far has that been? | |
| R: To a large extent this is where the theory and the practise become problematic in the real world. If I go to a particular school I will say I want to speak to so and so. Then I find out how is the project going, what is required, etc., etc., etc. The type of support which PDP gives, (Word unclear) which I can bring to bear, I say: You guys need completing this because there's the year mark that needs to be formulated. Now Michael | Again he says time is a factor that hinders this support.<br><br>He submits that it is in the aspect of support, that challenges occur when he says that there is a problem between Theory and practice in the real world. |

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(surname unclear) speaks about innovations can often doesn't become a reality in the lives of children if there's only support. There must be support and pressure. I can give that pressure to be by saying this project is brilliant; we need to make sure that you complete it by such time. To what extent I've be able to do it consistently varies.

  Again, it is to do with the reality of my work. Again, Environmental Education is not formally not part of my job description. And I think that is part of the challenge.

I:        When you were with PDP, were you a Curriculum Advisor?

R:        Yes.

I:        In Life Sciences?

R:        Yes.

I:        And Life Science has outcomes.

R:        It doesn't have outcomes per se but you can integrate Environmental Education in to that. You will not be able to go and run a work shop in Environmental Education with Life Sciences. When you doing Life Sciences you can say that Life Sciences lends itself to Environmental Learning. That one can do. But now you must also keep in mind with the new SG in our province, she is saying we must not run unnecessary work shops with teachers. This would be an unnecessary workshop in her mind. She stated that there must only be 3 workshops for the whole year and that must be no (unclear) for monitoring the year mark process. So even there the situation within the department is becoming more and more problematic. So I cannot call teachers to a workshop; Achieng can as an outsider. She doesn't have to adhere to. Teachers have the democratic right to decide do they attend or not. I can go and speak to them unofficially and say: I want you to get involved, these are the benefits. The situation

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He comes back to admit that EE is not part of his Job description and this becomes a challenge for him. On the other had submits that he was a curriculum advisor in life Sciences....?

Excuses! If EE is to be integrated is a smaller unit of the life sciences that should be monitored as well. Actually EE helps in better learning of the other aspects of life sciences, Please!!!

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| as far as keeping in mind in the present review process (Unclear) Environmental Education might be out of the curriculum.  Because none of us were asked to be on the review team to watch that Environmental Education remains. Sometime in August the document will become public for public critique.  And if the situation is what we are assuming, it's even going to be tougher to call workshops for Environmental Education.  Environmental Education will have to go under the guides of how we improve the teaching and learning processes in classrooms.  The Environmental Education orientation to teaching and learning (unclear.  He said something concerning a workshop.) | Departmental work situation is making it problematic for support of teachers. *I did not ask for a workshop, but support of individual teachers Hey!* |
| I:        Yes, I do not see Environmental Education in the previous Curriculum.  The Curriculum that is working now, I do not see it as a distinct subject that has been taught. But I see it in the life science as it is integrated. That is to say it is part of the Life science in one... Integrated.

R:        In South Africa we decided that it shouldn't be a distinct subject as in Australia.

I:        Yes, so it is integrated

R:        It is integrated but that is part of, philosophically it's correct, but reality and practically it is not working because, if it is integrated it assumes that teachers have the knowledge to be able to see it in that Curriculum.

 Keeping in mind that only about 5% teachers in South Africa to a large extend, has had any formal Environmental Education in their teacher training.  That 5% would be able to see Environment in an integrated Curriculum; the majority is not and that is part of the problem.  Coming back to your question of what is the involvement of Curriculum Advisors in Environmental Education, it is very limited due to the constraints of the job | Agrees that EE is integrated and not a separate subject. Thus, needs the same respect as life science as it is treated as one!!!!!!!!!

Abit contradictory! If it is one as they want should be treated as one. Because I think the same topics of discussions in life science are taken further into practice........ there is a possibility!!!!!

That is why this training needs to be taken seriously.

Indicates that most of the teachers here are not trained in EE. |

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| description of the Curriculum Advisors. Secondly to a large extend, them not having an interest in Environmental Education due to the lack of knowledge in that field.<br><br>I:	No, I still want to ask a question with regards to this.  I here there is a new curriculum coming on, what is you take?<br><br>R:	The new revised Curriculum, the National Minister is making an announcement today.  To a large extend, we going to a very strait jacket Curriculum.  Content will be specified per term.  That give flexibility, I don't know.  Does that mean you need to train teacher better to be able to see potential for Environmental Learning?  Yes.  But, at this stage I've got nothing in black and white and I first want to see the document itself.  I think it is going to have huge challenges if what I've heard is correct, the strait jacket Curriculum has been introduced.  I can see the reason for it, I might not agree, because in a large number of schools, nothing is happening.  Having this type of (word unclear) way of putting a Curriculum together.  Maybe it works for some schools.  But let's wait and see.<br><br>I:	Do you think interventions like PDP is still important in PD programmes for teachers?<br><br>R:	First of all, to what extent PDP is involved in Professional Development, there are rumours circling that changes have to be made by them.  Professional Development by partners that I've been working with will always be important.  The challenges of on-going Teacher Professional Development are huge and the District can never do the function on its own.  To large extent we do crisis management.  We don't really do Teachers Development with all these theories and principals.  So if an organisation like PDP with people that got the necessary background to do it, I personally would welcome their continuing in this field to supplement what we do.  Working with a few teachers in an on- | With this knowledge there should be a focus in helping the teachers to see this! Reason for training lead teachers to help with this integration.<br><br>At the time of this interview, the curriculum is undergoing revision and change.<br><br>Agrees to the importance of PDP programme.<br><br><br>The department need partnership with organisation like PDP to do professional development for teachers.<br><br>Depicts that the department has been doing crisis management not professional development.<br><br>Recommends continuity and sustainability of PDP's programme as it is an essential part in growing teachers for the district and the department. | |

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going way over time. So yes, I would love them to continue.

I:     So what suggestion will you render in order to improve the implementation of PDP's programme?

R:     Okay. I think we need to look at improving the monitoring and the evaluation of the implementation. Is the Curriculum Advisors playing the best role it can as far as monitoring? Are the reflecting work with teachers to see how we can improve that? You understand? That is immediately for me the most important. Monitoring and evaluation. What would also be good if, monitoring. If one has the time to actually go to the schools and sit in when the teachers are running the programme to give feedback to the teachers about what they are doing. So it is evaluation at two levels: Evaluation where you give feedback to the teachers on your observation and then is also evaluation to the programme itself. Again the reality is that to what extent, Achieng doesn't have the time to do that, I don't have the time to do that. Consequently one puts a proposal together and then there's enough money actually to have somebody to do that as a (word unclear) to a student or something like that. To make sure that an effect is given to quality monitoring and evaluation and not my chance is hugely problematic. Look at myself, there are about 65 high schools that I have to go to.

I:     Just you?

R:     There's only one Life Science Advisor in the district and there's 65 high schools in the district. And if I must assist with Life Sciences it makes the workload even more crazy. Because senior phase is Grade 7, 8 and 9. Grade 7 is in the Primary Schools. We have about 100 Primary Schools in our district. So the workload of Curriculum Advisors is one of the main reasons that impacts on the quality of support that Curriculum Advisors can give. And then to compile this, next year in the new Curriculum.

To me the Crux of the matter

For improvement:
Recommends:

Better **monitoring** and evaluation of implementation.

Recommend indicators for monitoring and evaluation.

He recommends close interaction with teachers, giving feedback through observation on what the teachers are doing.

The reality he says the PDP officials and the curriculum advisers have no time to do this.

I suggest that this PDP as well as the Curriculum Advisors needs to see the importance of either carrying out this support or employing someone to do this, it will take the department and SANBI, a great advantage in their PD that they have organised.

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| I'll have to support in the same school two Curricula: the old NCS and the new NCS. It increases the workload even further. The workload is not only got to do with the number of schools, that's to do with the number of curricula that you are supporting, it has to do with the number of additional projects that you're involved in, it has to do with the number of committees you sit in... So the workload is horrendous….. | The monitoring role and evaluation is too much for only one curriculum adviser or one Trainer from PDP even though the schools involved in this special programme are only 2 to three teachers within the district.

Very good way of viewing EE.

Continuity of the PDP.

Monitoring and implementation

Feedback mechanism in evaluation.

Quality monitoring.

Workload on the Education department officials that hampers their role in monitoring this specific PDP | |

# Appendix 7: Summary of themes that emerged from data.

| PD programme organisers | Curriculum Advisors | Teachers (participants in the PD) |
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| Historical background | Roles of Curriculum Advisors:<br><br>• Research consultants<br><br>• Participants at the workshops<br><br>• Selecting participants<br><br>• Provide sustainable support for teachers<br><br>• Ensure that projects meet scientific criteria<br><br>• Create awareness of PD programme<br><br>• Create further opportunities of PD for teachers<br><br>• Link /Between PD and teachers-communication channel<br><br>• Check for PD alignment with curriculum requirements for teachers<br><br>• Approve programmes before they go into schools. | Program coverage and focus:<br><br>• Life science teachers<br><br>• Ten schools<br><br>• 15 schools<br><br>• Teachers in EE and integration<br><br>• Action projects<br><br>• Saturdays( every second week of the month)<br><br>• Aspects of Biodiversity<br><br>• Run for three years |
| Programme evolution | Duration of the PD programme | How teachers were introduced to the PD:<br><br>• Informed by CA<br><br>• Emailed<br><br>• Letter<br><br>• Principal said go...<br><br>• Willingly attended<br><br>• School was asked to she had to go<br><br>• Two days before the workshops began<br><br>• School principle |

| Conceptualization of the programme objectives, aims and goals | Academic and professional background. | Take-up: <br> • Practical aspect <br> • Integrating New knowledge <br> • New ways of teaching <br> • Awareness of curriculum content in EE <br> • More knowledge in plants and Fynbos <br> • Diversity of teachers <br> • Gained a lot of information <br> • Learned more freely without tension <br> • Gained new understanding <br> • Empowerment and more able <br> • Ability to support other schools <br> • Differentiate between EE and Environmental Studies <br> • New lenses to view EE <br> • Awareness and availability of EE in life science <br> • Issue based learning <br> • Active learning Framework <br> • Do EE in a more constructive way <br> • Improve local environmental issues <br> • Refresher course <br> • Global warming, sustainable development <br> • Deliberation and intentionality in doing EE <br> • Learned to plan lessons better. |
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| Building of partnership | Commitment and passion | Implementation: <br> • Knowledge gained made |

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| | | classes interesting. |
| | | • Facilitate a project with her class |
| | | • Action project in the sand dunes |
| | | • Supply sees to neighbouring school |
| | | • Developed resource gardens |
| | | • Bought a recycling container |
| | | • Crop propagation |
| Epistemology, ideologies and ontological views that informed the programme | Partnership | Continuity of the programme: <br><br> • Needs more meaningful support <br><br> • The three year period needs to be looked into <br><br> • Increase contact sessions <br><br> • Reduce a given content at a workshop <br><br> • Distribute contact sessions evenly through the year <br><br> • Follow up workshops <br><br> • Create more awareness of EE in life science |
| Criteria of participants selection/requirements | Challenges of implementation: <br><br> • Transportation <br><br> • Time management <br><br> • Workload | Partnership |
| Transformations that took place from the programme inception | Suggestion for improvement. | Criteria of selection: teachers perspectives |
| Form of activity- training through workshops | Availability EE in life science – need in time | • Challenges of implementation: <br><br> • Tight syllabus <br><br> • Size of classroom <br><br> • Age of learners <br><br> • Lack of support and monitoring |

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| | | • Support with planning and budgeting<br><br>• Time |
| Workshop design | Limited knowledge on EE/ attitudes towards EE | Attendance |
| Challenges faced by the PD:<br><br>• Absenteeism<br><br>• Transportation<br><br>• Lack of teacher exposure/level of academic background<br><br>• Change and transition in the National curriculum | Site/resource and distance of the workshop from schools | The workshop: |
| Lessons learned by the PD providers – suggestions for improvement. | Workshop relevance to curriculum requirements for teachers | teacher leadership |
| | EE outcomes in life science | Nature of school management |
| | Partial collaboration | Nature of school timetable |
| | | Teachers attitudes towards EE |
| | | Teacher awareness of the importance of the PD programme |
| | | "nothing New" |
| | | Teachers' disappointments. |