

**Using the local environment for  
outcomes-based education: Issues raised  
for INSET by teachers' perceptions of  
agents of change.**

HALF THESIS

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## ABSTRACT

South African education is in the process of undergoing what has become known as a “paradigm shift”, requiring a change from the familiar transmission method to outcomes-based education (OBE) founded on social constructivist theories of learning and teaching. Teachers, (45% of whom are poorly qualified), will play a pivotal role in the success or failure of this change. There is therefore an urgent need to re-educate in-service teachers in the philosophy, and related methodologies underpinning Curriculum 2005. To this end, in-service education courses need to be developed which will encourage teachers to reconstruct their beliefs about teaching and learning.

INSET programmes in the past were aimed at either “topping up” qualified teachers, or “adding on” for under qualified teachers - neither of which have proved successful. It is therefore unlikely that applying similar methodologies to support teachers in the shift to OBE will meet with success, nor will simply “training” teachers to use the new learning programmes. Government documents on Education Policy are calling for teachers to become reflexive practitioners, able to guide learners in their efforts to achieve the critical outcomes which are intended to develop a competent citizenry of lifelong learners. Therefore, teachers ought to be empowered as curriculum developers in their own right.

This interpretative case study hoped to find out from teachers themselves what aspects of an activity-based environmental education course acted as change agents in assisting them to begin the shift to constructivist theories of teaching and learning. A variety of research tools were used, including questionnaires, interviews, journals, narratives and concept maps, all of which provided a rich source of data for interpretation. From what was gained from four participants in this research, tentative suggestions for incorporation into the next cycle of action research in future INSET programmes are made.

### **DECLARATION**

This research represents original research by Noreen Burton (in collaboration with her research participants) and has not been submitted in any form to another university.

Where use was made of the work of others, it has been duly acknowledged in the text.

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## CHAPTER 1

### SETTING THE SCENE

#### 1.1 CONTEXT OF AND BACKGROUND TO THE RESEARCH:

Very few people are privileged, as South African educators have been during 1996/7, to play a major role in the reconstruction of their national education policy (Curriculum 2005), and as I<sup>1</sup> am, as an in-service (INSET) provider, to be part of the implementation of the new curriculum and the ongoing education of teachers in the classroom. The importance attached to this task is made clear in the following quotation from the draft document for the White Paper on INSET:

*Teacher development is arguably the most vital strategy for education reconstruction and development because competent teachers are the key to quality education and, unless they support change (my stress), most efforts at reconstruction will be ineffective. (South Africa 1996c).*

Are the majority of South African teachers “competent “ to provide “quality education”? If the answer to this question is negative, then what is the most appropriate means to develop a competent teaching community who are able to provide a quality education for each learner? The history of teacher training for Black teachers shows that little was done in the past to ensure that Black learners received an education which prepared them for life in a modern world. It is teachers coming out of such a system who are being asked to make major changes in their approach to teaching and learning. The current INSET model for teachers coming out of such a system in the Eastern Cape Province is what is known as the deficit model, which aims to “add on” knowledge and training in order to raise the standard of teaching. This model is totally inappropriate for the major changes required for the implementation of Curriculum 2005.

I believe that the key to the success of Curriculum 2005 lies in teachers making the paradigm shift called for by the National government, since what goes on in the classroom depends largely on what the teacher perceives as being worthwhile teaching, and how the learners are engaged in acquiring knowledge and understanding. Constraints to success lie in the perceptions held by teachers e.g. fear of the unknown, or for the majority of teachers inadequate PRESET education in constructivist teaching and learning methods. It must therefore be expected that the change will take quite a few years, and this research was done as a means of taking the first tentative steps towards implementing effective INSET programmes.

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<sup>1</sup>Since I am a woman, as are the participants, I have chosen to use the feminine pronoun rather than the cumbersome he/she/they form. This by no means implies that I disregard men!

## **1.2 FOCUS OF THE RESEARCH:**

As an INSET provider coming from a different cultural background to the majority of the teachers with whom I work, I need to understand, from the teachers' point of view, some of the factors (past and present) which influence them, and assist them in beginning to make the change from the existing Behaviourist model of education situated in the Positivist philosophy, to the new outcomes-based model situated in Socially Critical Theory. Only then will I be able to plan INSET workshops which will be interactive, meaningful and effective.

Most of the research on teacher education in a Post-modern philosophy comes from sophisticated, affluent First World countries (Lather 1986, Prawat 1992, Fien 1993, Farnham-Diggory 1994, Ballantyne & Packer 1996, Hart 1996), and it is not clear to what extent it is appropriate to apply the findings of such research to the majority of South African teachers, many of whom are just beginning to enter the modernistic age. Note has also been taken of research carried out with teachers in Zimbabwe (Stiles, 1996) warning of inhibitors to teacher change especially when applying programmes from a different cultural context. What is the most appropriate way of helping teachers to understand the basis for the change and cope with new teaching/learning strategies? How can anyone be certain that the called-for change will last and that teachers will not revert to simply applying Behaviourist teaching methods to the new Learning Programmes?

## **1.3 GOAL OF THE RESEARCH:**

This research is the first cycle of a future series of Action Research projects, each of which will be informed by the findings of the previous ones.

By taking part in a long-term environmental education programme for teachers, and walking alongside four of the students, I hoped to discover from them whether they changed their world view, and if so, what aspects of the course made them willing to change. The results of the research will form the basis for the first of a series of INSET workshops aimed at supporting teachers through the change to Curriculum 2005 and beyond.

## **1.4 OUTLINE OF THE THESIS**

*INSET programmes should be underpinned by relevant theories and concepts derived from theories of education learning, change and organisations.*

(South Africa 1996c: 4)

This thesis aims to tell the story of four educators. It begins in Chapter Two with a brief historical background to explain why there is a need for education in South Africa to change, and what that change is envisaged to be. I will show by reference to some current literature on environmental education, Socially Critical Theory and constructivist theories of learning, that the required change is a change to environmental education (EE), and that by applying the principles of environmental education, South African education can go a long way towards achieving its goal of OBE. Teacher education being the crux of the research, I will explore literature to gain insight into appropriate methods of re-educating adults who may be set in their ways and unwilling to change. Finally, I describe the programme on which the four teachers and I shared our experiences.

Chapter Three describes my choice of research paradigm, and why I felt this was the most appropriate one, the research instruments and the process of data collection. In Chapter Four I present the data collected from questionnaires, interviews, journals, narratives and concept maps. In Chapter Five I present the findings in the form of stories of the four teachers, a colleague and a non-participant observer and this chapter closes with tentative recommendations for INSET which would take the process further and give us valuable insight into new ways of approaching teacher education in South Africa.

The story closes in Chapter Six with a critical reflection of the research paradigm, the tools and the case study.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 INTRODUCTION:**

South Africa began the process of reconstruction in 1994 with the publication of the Reconstruction and Development Programme (RDP) (South Africa 1994), based on People's Education, a policy of the ANC in exile (van der Heever 1987, Mashamba 1991). The philosophy underpinning this policy has been incorporated into the White Paper for Education and Training (1995a) and the related discussion documents (South Africa 1995b, 1996a, 1996b, 1996c, 1996d) which initiated and informed this research, and which is stated clearly in the Curriculum Framework Document (1996b) as being Socially Critical Theory, incorporating Outcomes-based Education (OBE). For education, this requires a change from the traditional "transmission" model, based on Fundamental Pedagogics (Enslin 1984), which failed to meet the needs and aspirations of the majority of South Africans.

1997 was a watershed year in education in South Africa. This is the year during which teachers will be exposed to the change in approach to teaching, learning and assessment, and for many of them it will be the first they have heard of outcomes-based teaching. It is a year of uncertainty and concern as teachers are required to make a complete change from the known, behaviourist, transmission method that they themselves experienced, (and which is currently practised in the majority of Teacher Education colleges and schools), to learner-centred teaching methods as required by the new approach to education and training. I felt it was important to understand the processes which would help teachers make the change, so that these could be incorporated into the INSET programmes which will be needed to support teachers as they take their rightful role as curriculum developers.

One of the principles for education and training is Environmental Education (EE) (South Africa 1995a:18). EE, as defined by the IUCN (1971) and the Tbilisi Principles (UNESCO 1977), stresses an holistic approach to education where the knowledge, skills, values and attitudes necessary to live sustainably in a democratic society are developed through learner-centred teaching methods. Situated as it is in the New Environmental Paradigm, which incorporates the philosophy of Socially Critical Theory (Fien 1993), EE offers a methodology by which the philosophy of the Education Policy can be implemented, particularly since EE draws on Social Constructivist theories of learning

which are pupil-centred and outcomes-based. (Klein & Merritt 1994). In order to develop a corps of environmentally literate teachers, the personal knowledge of the environment, the skills necessary to live sustainably and the attitudes of those teachers towards the environment, need to be awakened and developed (Fien & Rawling 1996).

What is the best way to help South African teachers realise the value of, and embrace OBE? How can this be done? Will First World practices on which the new curriculum is based be appropriate for the South African situation? Does EE in fact hold the answer?

These are questions to which I hope to get some answers from current literature. It is also important to understand how the current theories of learning can inform in-service teacher education (INSET) practice, and how INSET needs to be changed in order to re-educate teachers so that they become agents of change, competent to develop in their learners the values and principles of the White Paper for Education.

In an attempt to answer some of these questions, the first part of this chapter will present an analysis of the relevant Government documents to illustrate the paradigm shift from the philosophical stance of CNE to that of OBE in the White Paper of March 1995. An analysis of the current view of environmental education, which is now to be an integral part of education and training, will be linked with theories of how humans learn, and some current literature on teacher education. I will argue that EE offers the most appropriate methodology for effecting the change. The second part of the chapter will deal briefly with the Rhodes University Certificate and the Gold Fields Participatory Course in Environmental Education (The EE course). This course exposes teachers to the theory underpinning EE and the philosophy of Socially Critical Theory, whilst giving practical experience in issues-based fieldwork and OBE.

## PART ONE

### 2.2 HISTORICAL CONTEXT:

Before analysing current documents, it is necessary to understand the philosophical foundation of the previous educational policy accounting for the *status quo* in education. I do not intend to offer a detailed analysis of the previous government policy, only to explain how it is that education in South Africa has failed to produce citizens competent to live sustainably in a democracy.

The Nationalist government which came into power in 1948, put forward Christian National Education (based on the educational theory of Behaviourism under the guise of Fundamental Pedagogics and Rational Empiricism), as the means by which the peoples of South Africa could be educated, but remain culturally separate. Education for the Black majority was of a lower standard than for White children, and designed to keep them on a lower social level than Whites (Enslin, 1984). All children, regardless of cultural background, received an education which entrenched the notion of White Afrikaner supremacy, so central to the ideology of CNE, and were taught “scientifically” using the Behaviourist model. This was so successful that a large percentage of the population of all races came out of school accepting what they had been taught as “the truth”, and, in the case of Whites, often unaware of the plight of other race groups.

The African National Congress (ANC), while in exile, drew up an alternative education policy which they called People’s Education, which drew heavily on Socially Critical Theory, and particularly theories of resistance and liberation (van den Heever 1987), and which rejected Apartheid Education as education for domination. People’s Education claimed to be a process which was already transforming education, but which could only be fully achieved once Apartheid had been abolished.<sup>1</sup>

With the change in government in 1994, the opportunity to overhaul education and training was presented. The ANC government called for public input into draft documents for discussion at local level. Feedback from all interested parties was considered before further discussion documents were put out by the Ministry of Education. Of these, only the White Paper for Education and Training has been gazetted to date.

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<sup>1</sup>In this respect, I believe that People’s Education has failed in the Central Region of Eastern Cape Province. Far from seeing a vision become reality after 1994, many Black schools which I visit in the course of my work, are in a state of near collapse. Pupils arrive and leave when they choose, teachers are very often absent from the classroom, schools are vandalised by pupils as well as by the community - in fact, at present, it looks as though Apartheid may have lost the battle, but may well have won the war. There is a need to rekindle the flame of education in both teachers and learners, for the sake of South Africa’s future in the world economy.

## 2.3 ANALYSIS OF GOVERNMENT DOCUMENTS FOR EDUCATION AND TRAINING

Paragraph 1 of Chapter 4 of the **White Paper for Education and Training** (South Africa 1995a) states:

*It is necessary to identify the values and principles which, in the view of the Ministry of Education, should drive national policy for the reconstruction and development of education and training. (Page 15)*

The rest of the chapter spells out the desired values and principles for education. The first eleven concern the management of schools, and the last three relate to the sustainability and productivity of the education and training system. This research relates to the values and principles as described in paragraphs 12 - 20 which concern teaching, learning and the intended outcomes of education and training.

A principle specifically mentioned is that relating to the environment. Paragraph 20 states that environmental education, using an “active approach ... must be a vital element of all levels and programmes of the education and training system” (South Africa 1995:22). This suggests that environmental education should be part of every teacher’s education, and incorporated into lessons, lectures, and practicals, so that all educators, in turn, can effectively incorporate environmental education into their teaching.

Further support for EE is given in the document entitled **Structures for the Development of National Policy Regarding Curriculum and Related Issues. Discussion Document**. (South Africa 1996b). This document, whilst primarily aiming to describe the proposed structure for broadening curriculum development, is very closely aligned to the March 1995 White Paper. It focuses on education for lifelong learning and how this could be achieved through the notion of lifelong learning development which is described as:

*a dynamic process, whereby teachers and learners function as learners, lifelong, in a changing, developmental and transformational context. (p 13)*

The document emphasises the construction or generation of new knowledge through learner-centred teaching, with the emphasis on the learning process, rather than the product (p10).

Lifelong learning is based on the following principles:

- learner-centredness
- flexibility of learning provision
- removal of barriers to access learning
- recognition of credit for prior learning experiences
- provision of learner support
- construction of learning programmes in the expectation that learners can succeed
- maintenance of rigorous quality and relevance assurance over the design of learning materials and support system (p 11).

The importance given to developing a free, just and equitable society of critical and independent thinkers, illustrates a paradigm shift from Positivism and Fundamental Pedagogics, to Socially Critical Theory. This is specifically stated in Appendix 1 of the **Draft Document: Curriculum Framework for General and Further Education and Training** (South Africa 1996a:43). This Curriculum Document states that education in South Africa is to be outcomes-based (ibid:16), which constitutes a major shift away from the traditional transmission method, but which brings with it problems particular to South Africa. OBE will be discussed later.

Teacher education is of vital importance if the proposed change in education is to become a reality. The so-called COTEP document (**Draft Document Norms and Standards for Teacher Education**, South Africa 1995b) which lays down the minimum standards for teacher education is closely linked to the White Paper and the Curriculum Frameworks document. Section 1.2 (Aims for Teacher Education) of the COTEP document states:

*Effective teaching will require a knowledge of the learning process and the acquisition of appropriate knowledge, skills, values, attitudes and dispositions which take cognisance of the political, economic, environmental and social context in which the teaching and learning are to occur. (p 6)*

The same quote could be used to describe environmental education, as will be discussed later. Many of the skills which teachers will need, as listed in Section 1.2.3, are the skills which environmental education strives to develop, as are many of the values, attitudes and dispositions as listed in Section 1.2.4., and the competencies listed in Sections 1.3.1 and 1.3.2.

### 2.3.1 OUTCOMES-BASED EDUCATION

Outcomes-based education (OBE) takes as the starting point, the demonstrable outcomes desired at the exit point of an education programme, rather than the content of a syllabus. Three approaches to OBE can be identified - Traditional (or, more correctly, content-based objectives, because the starting point is the existing syllabus), Transitional OBE, which, while still relying to some extent on the traditional methods, uses some planning processes, and Transformational OBE, which gives priority to higher-order competencies, such as critical thinking, problem solving, communication and the development of skills, values and attitudes, rather than to content (Spady, 1992). South Africa is embarking on Transformational OBE as summed up by Spady (South Africa 1996d:24).

OBE focuses on:

- the learners' achievement relative to themselves rather than others.
- competence, rather than intelligence,
- the "best", rather than a typical performance, based on agreed criteria,
- helping, rather than hindering an individual.

There are, however, advantages and disadvantages to OBE, both for educators and for learners. For educators it allows the use of a variety of resources to make learning meaningful to learners, and encourages them to develop what is worthwhile in education, rather than teaching content which may be irrelevant to the learners. Educators become accountable for producing the exit outcomes in every learner, but this means that they need to monitor both groups and individuals continuously, in order to assess each learner's progress. This is difficult with large classes. Educators find it time-consuming to prepare and manage resources, as well as to ensure that each learner receives remediation or enrichment suited to their needs. Since many educators find it difficult to draft outcomes and to write assessment criteria which are a true reflection of learning, extensive staff development and monitoring in order to achieve the exit outcomes in learners is required.

There seem to be very few disadvantages for learners. For them, learning occurs in a social situation in which they help each other. Learners are given information about their strengths and weaknesses, which encourages them to aim for their "best" performance and makes them responsible and accountable for their learning. Learners are encouraged to develop skills and attitudes as well knowledge, which prepares them for life in a modern world, but this can become a weakness.

A criticism levelled at Spady's version of Transformational OBE by Manno (1994) is that exit outcomes tend to focus on affective development at the expense of academic achievement. Many outcomes are nebulous and not easy to assess, thus making accountability for achieving them impossible. Manno, supported by Hughes (1996:58), also queries who chooses the outcomes, fearing that if they are state imposed (in order to bring about a new social order), parents and teachers who will have little say, may find that the outcomes conflict with their own values and beliefs.

Western countries which have already changed to OBE have done so over a number of years, and only after a lengthy trial period, including intensive re-education of already highly qualified teachers. South Africa hopes to introduce the system in a period of eighteen months from inception, with a six week trial period for Grade 1, a one year trial for Grades 2 to 12 and with generally poorly qualified teachers. In addition to these constraints, a lack of money and resources has meant that although OBE was to have been introduced in three phases, this has gradually been reduced to one. There are serious doubts as to whether it is possible to implement OBE throughout all Regions of all Provinces, given the inadequate physical and human resources at this time in South Africa (Naki, 1997). There are also problems associated with introducing OBE in schools where, as a result of the political climate of the country, there has been a serious lack of a culture of teaching and learning for many years (Bishop, 1997). The negative press has had the effect of making teachers even more wary.

The South African version has seven Critical Outcomes for education and training which focus on transforming society. These will be applied across the whole spectrum of education and training, and in all eight Learning Areas. All seven imply that learners "will be able to ...". The question needs to be asked: Will these outcomes be developed by the teaching strategies of Socially Critical Theory as implied in the Education Policy document, or will teachers revert to the more familiar Behaviourist strategies? (Hughes, 1996: 58).

All of the Critical Outcomes listed in the document are aspects of environmental education and therefore can be achieved through the methodology of environmental education. This will be dealt with in more detail below. It is because of this close similarity that I chose to work with teachers on

the EE course. I believed that by looking at the aspects of this course which helped teachers to change, would give me insights into what may help teachers change to OBE. <sup>2</sup>

### 2.3.2 SUMMARY:

The core document underpinning the reconstruction of education in South Africa as part of the RDP, is the White Paper for Education and Training (South Africa, 1995a). Central to this education policy is chapter 4. The documents relating to lifelong learning development (South Africa 1996d), and the associated curriculum development (South Africa 1996a), as well as teacher education (South Africa 1995b, 1996c), draw heavily on these values and principles. The problem arises when consideration is given to in-service teachers, whose task it will be to implement the changes in the classroom. These teachers are a product of a different approach to education, and will need extensive re-education into the philosophy underpinning educational reconstruction as well as the related teaching and assessing methods. It will be argued below that the methodologies of environmental education are ideally suited to the implementation of the new education system in South Africa, and serve the dual purpose of developing an environmentally literate citizenry.

However, I believe that teachers themselves can and should inform INSET programmes (Robinson, 1992, Stiles, 1996). How can a teacher educator help teachers to internalise these major changes?

## 2.4 ENVIRONMENTAL EDUCATION

Over the past twenty years, the concept of the environment has evolved from that of a purely biophysical reality "out there", which humans manipulate for their own benefit, and in the process, damage, to one encompassing the social aspect of human intervention. This broadening of the concept requires a consideration of the political, economic and socio-historical processes which impact on the biophysical environment, and which are the underlying causes of environmental degradation.

Environmental education has undergone a similar evolution from education **about** the environment, through education **in** the environment to education **for** the environment (Fien 1993). The role of

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<sup>2</sup>In addition to the Critical Outcomes, each Learning Area has its own Learning Area Outcomes and Specific Outcomes. It is here that relevant knowledge ought to be developed through appropriate learning programmes. During this research period, the writing of learning programmes has been taken over by a national Technical Task Team, leaving teachers feeling disempowered, and making the task of educating Grade One teachers in the three new Learning Programmes, problematic. Unless the writing of learning programmes is done with wide consultation and transparency, South Africa may well qualify in the future for the same criticism of OBE as is occurring in America (Manno, 1994).

education is seen by environmentalists as equipping people with the necessary knowledge, skills, values and attitudes to live and operate responsibly in a democratic and sustainable world (EEPI 1993, Ballantyne & Packer, 1996:25).

This change in focus is illustrated by the following definitions. The IUCN (1971) definition states:

*Environmental education is the process of recognising values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the inter-relatedness amongst people, their culture and their biophysical surroundings. Environmental education also entails practice in decision making and self-formulation of a code of behaviour about issues concerning environmental quality.*

Huckle (1991) on the other hand takes the definition a bit further by bringing the solution into the classroom and lays the stress on education for rather than about the environment:

*Education for the environment should be a shared speculation with pupils on those forms of technology and social organisation which can enable people to live in harmony with one another and with the natural world.*

Whereas the IUCN definition suggests that each of us ought to formulate our own code of behaviour, Huckle intimates that this is the responsibility of public bodies, particularly the school, showing the influence of Socially Critical Theory. Irwin (1991) in his definition:

*Environmental education is a world-wide socio-ecological phenomenon of many dimensions. It is a sophisticated and holistic concept embracing ecological knowledge and understanding, total people-environment relationships, ethics, politics, psychology, sociology and public participation in decision making. It aims primarily to educate about human interaction with the environment.*

most clearly expresses environmental education for me, but I agree with Tilbury (1994:17) who claims that environmental education should take into account the culture and gender perspective. She claims that marginalised peoples, whose philosophy and spiritual relationship with the environment have led them to live sustainably, and women, who have a different outlook and approach to dealing with environmental problems, have a lot to offer environmental education.

For me, the environment is not a simple concept. It includes everything that can affect us as people - the biophysical world and its life-support systems, the economic and political climate of the place in which we live, our understanding of how humans ought to behave towards other living things as well as towards each other, our personal philosophy (influenced by history, biology, religion,

gender and politics), our inner nature, our relationships within our social community, and our need to have a say in the decisions made by that community. EE for me therefore is not only about learning to live and operate in a democracy, but being aware too, of the fact that we have no other place to go when this planet is made uninhabitable, and the need to understand that despite human arrogance and faith in technology, we need the support and interaction with all other living things - plants and animals - in order to survive. It is only by becoming aware of the holistic nature of the environment and these relationships, that we begin to understand the consequences of living unsustainably.

Sia *et al* (1985/6) have shown that people who are environmentally active are generally those adults who had been involved as children, and those who participate in outdoor experiences such as family outings, hiking, walking and camping. They found that the factors which seem to contribute to responsible environmental behaviour are knowledge, problem solving skills in environmental strategies, sensitivity to the environment, the ability to work as part of a group, opposition to pollution, technological ambivalence and androgynous sex-role classification. This is supported by Ballantyne and Packer (1996) who point out that it is not enough to appeal to people's emotions in order to encourage them to change their attitude to the environment. Real change, they claim, requires equipping the people with knowledge to understand, and skills to effect the change. As the Belgrade Charter states:

*It is generally recognised that to achieve [responsible behaviour] educators must provide students with opportunities to acquire the knowledge, values, attitudes, commitment and skills needed to protect and improve the environment. (Ballantyne and Packer 1996:25)*

It therefore appears necessary not only to assist people to equip themselves with the knowledge and skills which will enable them to analyse issues affecting them, and to achieve effective solutions, but also to give people "outdoor" experiences which will help to sensitise them to the need for sustainable environmental management. How can education encourage people (especially adults) to change their attitude towards the environment? Or towards the new outcomes-based education system?

Behaviourists would set objectives, give the learners environmental "experience" suited to their developmental stage, and make sure that the learners achieved the objectives by testing them scientifically. This method has not met with success. Behaviourism fails because it aims to change

the learner's behaviour, and not the inner person (Young 1992). Many people would claim that Positivism, with its claim to predict and control natural phenomena through the use of the scientific method, has caused the problems - biophysical and social (Huckle 1986, Fien 1993) - that now face the planet, and that only when people have an informed say in decision-making will real, lasting change occur.

This sounds easier than it is in practice. Hart (1996) warns that since we, as humans, find it difficult to make even such small changes in our lives as starting an exercise regime, getting people to change their attitude to modernism in formal education will be much more difficult. He too, supports the argument put forward by Sia *et al* (ibid) by claiming that a person's personality plays a large part, and that only people who are committed will persevere. If this is so, then how does one get EE (or OBE) into the "bones" of people? This is the aim of this research - finding out what it is that makes some people willing to change.

#### **2.4.1 SUMMARY**

There is a marked similarity between the Tbilisi Principles for environmental education (see Appendix I) and the Values and Principles for Education and Training Policy. Both hold that education should be an interdisciplinary, lifelong process, which is learner-centred, and which develops knowledge, values, attitudes, skills and critical thinking and should encourage humans to interact with the environment in such a way that the planet remains habitable for future generations.

A review of some of the current literature on theories of learning indicates that Constructivism offers the best solution to the questions posed above. Constructivism is a methodology of Socially Critical Theory, a post-positivist philosophy, and one which is incorporated into both the New Environmental Paradigm and the White Paper for Education and Training. Before looking at learning theories, it is useful to briefly investigate SCT.

#### **2.5 SOCIALLY CRITICAL THEORY**

Socially Critical Theory (SCT) is a response to Logical Positivism, Humanism and Marxism, and questions the Positivist claim that what counts as worthwhile knowledge is that which is value-free. A central claim of SCT is that each person or group constructs their own reality, and that therefore worthwhile knowledge has, of necessity, to be value-laden. It requires us to look critically at our social institutions and structures, to challenge assumptions, the "taken-for-granted" in society, and

query the philosophical foundations for these assumptions. It strives to make society, or the learner, uncomfortable and insecure, in order to rethink established norms. In modern jargon, it “unpacks” knowledge.

SCT claims that knowledge/reality is not “out there”, but is socially constructed by individuals and groups in a particular context and time. For this reason there is no one right way of viewing reality. Knowledge is seen as transient and provisional and can therefore be contested.<sup>3</sup>

Whilst SCT claims to liberate and empower by allowing the person/group to form their own realities, it cannot dictate whose realities are right or best. It does not try to clarify which culture is preferable, since this would go against its claims to liberate. The result in South Africa will be that schooling reflects and promotes the culture of the dominant cultural group - as is the case in education world wide, since power and knowledge, according to Foucault, are found together (Firth 1996:16). Firth points out that to “em-power” implies that someone (the teacher) has power and helps learners to gain power for themselves. However, he rightly points out that if we accept Foucault’s conception of power as circulating and existing only in action, (or as Foucault put it, “individuals are the vehicles of power, not its points of application”. Firth 1996:17), it may not prove possible to “empower” people without taking into account their own subjectivity and their culture, and allowing them to construct knowledge for themselves.

South Africa needs to develop critical thinkers, who can take responsibility for their lives, see the possible problems ahead of them and be proactive in tackling them. This applies particularly to environmental issues. At present, too many people accept the damage done to the environment as being either not their problem or as being beyond their control. SCT, by encouraging people to question and challenge what is normally taken for granted, can help to stimulate change for the better in this country.

SCT seems on the face of it to be of great value to education in South Africa, but it also has its limitations. Teaching the SCT way requires a lot more time than the conventional talk and chalk or

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<sup>3</sup>I am ambivalent about SCT in that while my experience confirms that this understanding of social reality is accurate (as shown by e.g. cultural changes in attitudes towards women, or our understanding of cosmology), I still find it difficult to accept that some knowledge is not “out there”. Facts like the chemical composition of table salt or the location of the *Eiffel Tower* are “out there”. No amount of negotiation will alter the fact that table salt is composed of positive and negative ions (whatever our conceptual understanding of “ions” is or what we have yet to learn of subatomic particles) nor will it place the *Eiffel Tower* in New York. For all this, I am investigating teachers’ perceptions of social reality, and therefore, I trust that my ambivalence will not cloud my interpretation of their perceptions.

demonstrated practical. In order to accommodate the theories, the current syllabuses will need to be radically revised, the schools will need to be better equipped with resource material for both teacher and learner research and teachers will need to be re-educated in learning theories and continuous assessment. It is not an impossible task, but it will require quite a few years to implement effectively. If, as seems to be happening, the learning programmes are being written by a national technical task team, teachers will continue to feel disempowered, and this will make the process of internalising OBE far more difficult to attain.

### **2.5.1 SUMMARY**

As a theory, SCT has much going for it, but it needs to be looked at critically, and applied with wisdom. Cognisance needs to be taken of the fact that South Africa is still at heart a Developing country, and to apply an education philosophy and practice developed in First World countries, where the people are generally more sophisticated, and resources more readily available, is doomed to failure unless it is redesigned to suit the South African conditions, and implemented with sensitivity.

If there is to be a noticeable change in the educational standards in South Africa, cognisance needs to be taken of constructivist learning theories, so that the practice of teaching comes into line with the philosophy of education as implied in the White Paper.

### **2.6 CONSTRUCTIVIST THEORIES**

The philosophical stance which claims a particular ontology and epistemology, will employ a related methodology for the gathering of “worthwhile” knowledge. Positivism favoured Behaviourist teaching strategies. SCT prefers Constructivist methodologies which claim that by thinking about and reconstructing sensual and social experiences, people construct their own reality, and use language to communicate that reality (Klein & Merritt 1994). This makes the process of finding “truth” much more complex, and requires a lot of time to be spent in interpersonal negotiation. It requires teachers to handle the learning programmes of each learner individually - a daunting task, and one requiring a high degree of competence and confidence. In this method of working towards a socially constructed understanding, language is seen as most important because it is through language that we construct our meanings of reality and through which our theory can be put into practice. According to Constructivists, learning occurs in stages.

### 2.6.1 LEARNING THEORIES

SCT claims that the process of gathering knowledge occurs in three stages - de-construction of existing understanding in the face of a challenge, reflection on how to do things better, or on the alternative “truth”, and the reconstruction of understanding to find a way to use the new knowledge for self or group emancipation. Another way of expressing this is to “induce a state of cognitive conflict within the learner” (Ballantyne *et al* 1994). Such conflict causes the learner to reconstruct her understanding. This reconstruction, or internal organisation was claimed by Piaget to be sudden, but as Doll (1989) states:

*While the conscious breakthrough to a new level of organisation occurs suddenly and spontaneously, a long period of subconscious preparation appears to be not only important but necessary. Our modern methods of teacher-student interactions will need drastic revisions to enhance this model of learning. For one thing, teachers will need to combine supportive behaviour with challenging behaviour - equilibrium with disequilibrium — and to give students time to organise their own thoughts. (Doll, 1989: 250)*

An early constructivist, Vygotsky (1978), writing in Russia at the same time as Piaget expounded his theory of cognitive development, put forward a theory that children learn by talking their way through the process. He claimed that at first this was done by the child talking out aloud to herself, as her hands were busy carrying out the task. As the child matured, he claimed, the speech became internalised, but whenever new learning took place, the learner would revert to verbalising. In other words, new thoughts and ideas (knowledge and concepts) are formed by a process of verbalisation. Vygotsky also claimed that children develop as a result of historical-cultural interaction with older members of their society, and that these elders can stretch the child’s experience (or zone of proximal development, as he calls it) and aid intellectual development. Bruner (1986) coined the phrase “scaffolding” to describe the help given by elders which enhances the child’s level of development. Scaffolding can also be done by the peer group, who will “language” at the level most appropriate to the group. Prawat (1992) claimed that users should apply skills as they acquire them, and therefore the learner should be presented with situational learning - much like an apprenticeship (Farnham-Diggory 1994:464), whereby learning is embedded in real-world activities. He claimed that the social context is important because learners need time to explore ideas together, to question and discuss, but emphasised that the teacher should guide the learning experience to the “truth” within a desired time frame, so that learning does take place, not just debate and conjecture.

Vygotsky claimed that children learn both spontaneous and scientific concepts. He said that the spontaneous concepts are learned unconsciously through experience enriched by culture, whilst scientific concepts are taught. However, he claimed that if children have to learn in a second language, they lose the richness that spontaneous learning gives, and this can affect both the quality of that learning and also the further development of spontaneous concepts. To help prevent this and enhance concept development, it is important to allow learners to talk together about what they are studying, and to write it, in their own language. This has implications for education, since it means that learners need to be given the opportunity to verbalise, to test their knowledge, and to be scaffolded by the teacher into higher levels of intellectual development. Since most South African teachers did not receive this kind of education themselves, there are implications for in-service education of teachers.

## 2.6.2 TEACHING STRATEGIES

Ballantyne and Packer (1996) support Millar (1989), Saunders (1992) and Hart, (1996) by arguing that an individual's existing conceptions are part of their personal belief system and are not easily abandoned. In order to affect change, the person needs to constructively integrate new thoughts, feelings and actions into their present understanding. They suggest that the teaching strategies used ought to incorporate knowledge (facts), attitudes/values (feelings) and behaviour (action) over a long period, and use constructivist methodologies such as group work, because, within a group, individuals will be required to explain their stance, and be able to defend it against opposing views, which helps them to clarify their understanding. Learners should be presented with sensually as well as cognitively different challenges to their existing beliefs, and if they are subsequently unable to defend such beliefs, they are induced to restructure their understanding. It is only by encouraging learners to rethink their personal beliefs, that responsible behaviour will be developed.

Ransom *et al* (1996:13) argue for recognition of "the multidimensional quality of human intelligence", and that all intelligences ought to be stimulated and challenged if the whole person is to be developed. This view is supported by Hungerford & Volk (1990: 8), who claim: "The ultimate aim of education is shaping human behaviour". This they claim requires three stages: Knowledge, ownership and empowerment. They suggest that it is not just **knowledge** that results in environmental citizenship, but also the personality of the person, and the possession of appropriate skills to apply that knowledge. This has implications for teaching and curriculum development. Orr (1992:147) sounds a warning that whilst good programmes can equip people with knowledge, it is

the experience which should develop “I care” attitudes leading to empowerment to do something about environmental issues, which is often the weak point in a programme. If the experience does not reinforce intellectual and personal growth, change is unlikely to be permanent.

Hungerford & Volk (1990) claim that the next stage in environmental citizenship development is to develop a sense of **ownership** of an issue. People are far more likely to take action if they are affected by the problem. The last variable involved in developing environmental citizenship is **empowerment**. If people see that they can make changes, that they stand to benefit from becoming involved and know what steps to take, the chances of them doing so again are greater<sup>4</sup>.

Prawat, like Doll (1989), questions the claim that the curriculum ought to be fixed and mastered according to predetermined criteria. He sees the curriculum as a network of important ideas to be explored (much like the Areas of Learning in the new South African Education Policy). This means that there is a need for an open system whereby learners can reflect on their actions, explain what they did and why they did it. Therefore teachers should set broad goals to structure the process. This is similar to the National Qualifications Framework (South Africa 1996d) where certain learning outcomes are expected, but which allow for individual Provinces, Regions, schools and teachers to have the freedom to choose what else goes into the Learning Programme and what specific outcomes are to be achieved. There is a need for South Africa to concentrate more on re-educating teachers in Post Modern theories, and less on simply training them in the use of the new Learning Programmes.<sup>5</sup>

### 2.6.3 SUMMARY:

Research seems to indicate that constructivist learning theories offer a more appropriate approach to bringing about change. An important part of constructivist teaching is to give learners the necessary experiences and skills to enable them to construct socially acceptable meanings. Constructivist teaching relies on giving learners extensive sensory interaction with the external world. The development of critical thinking skills and effective communication of experiences are central to successful learning. These can effectively be achieved through group work, problem solving, hypothesis formulation and hands-on testing. To help internalise the knowledge, the affective domain needs to be included. Because of this, I believe that the lecture/seminar style of

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<sup>4</sup>These three stages can be applied to the change to OBE, and the need to involve teachers from the outset in the development of an open curriculum.

<sup>5</sup>It looks as though this is unlikely to happen, given the time constraints on implementation of OBE, but I feel that school-based INSET would allow for a dynamic programme to be developed.

INSET is inappropriate for assisting teachers to make the change to OBE. Rather, the three steps suggested by the research of Hungerford and Volk - knowledge, ownership and empowerment suggest a more appropriate programme of teacher education.

## 2.7 TEACHER EDUCATION

Teachers need to understand the implications of the policy shift for classroom teaching. Post Modern theories reject the closed system of modern education, stressing instead that:

*... curriculum planing should be a two-tier or hierarchical process. The first tier would involve broad, general goals, set by the teacher as the expert in the field - or done in collaboration with other experts in the field. The second tier would emerge as the particulars of the curriculum began to take shape. This tier would vary from class to class and would involve the class - teacher and students - working as a group or community. (Doll, 1989: 251).*

These words encapsulate the philosophy behind Curriculum 2005, and to this end the government document on guidelines for INSET states that *"INSET programmes should be underpinned by relevant theories and concepts derived from theories of education learning, change and organisations"* (South Africa, 1996c).

### 2.7.1 REFORMING EDUCATION

At this point it is worth reviewing some current literature on bringing about change in education. In an open system like a school, this is a very complex process and can take a long time. I feel that in the light of the speed with which change is expected to happen in South Africa, it is worth noting the findings from other countries.

Walsh (1992) claimed that each teacher holds a particular world view and that this world view influences the way she teaches, but that the way she teaches also informs her theory (praxis), and called for teachers to be more reflexive in their practice. Barrow (1990) supported Walsh by claiming that the reflective practitioner is not a new idea - all practice is based on some theory. However, the reason teachers tend to deny the link between theory and practice is because the theory is not taught in the right way. The theory on which to base sound pedagogy should according to Barrow (1990) be a thorough grounding in philosophy, sociology and psychology on which teachers can draw in order to develop truly educated persons.

Prawat (1992:356), like Barrow and Walsh agreed that teachers' views of teaching and learning influence their classroom practice, and that to get teachers to change their classroom practice requires three criteria. They must

- be dissatisfied with their present beliefs
- find alternative meanings
- forge a link between the old and the new.

Etchberger and Shaw (1992) described an example of how a teacher can change from a positivist outlook on education to a constructivist one. They pointed out that teachers go through a series of changes as they begin to explore how students learn. They described five categories which can be seen as an extension of Prawat's:

1. Perturbation (dissatisfaction)
2. Awareness of the need to change (the old methods are not seen as successful)
3. Commitment to change ( the decision to take action)
4. Vision (being mentally prepared to actually make the change)
5. Projection (putting the change into practice)

To assist the change, Etchberger & Shaw (1992) pointed out that it is important for the teacher to reflect throughout the process. Teachers are therefore encouraged to keep journals because it is only when teachers become more reflective that they begin to challenge their own traditions of teaching.

I agree entirely and feel that INSET ought to include activities to be discussed in groups, but applied in the classroom, reflected on and recorded in a personal journal. This view is supported by Higgs (1990) and Davidoff & Robinson (1992) who claims that teacher education ought to be concerned with the development of individuals with worth, dignity and creativity, not with trained technocrats, serving the national economy. To this end, teachers need to learn how to use their education to arouse their learners' curiosity, develop judgement, encourage perseverance and independence, whilst inspiring creativity and adventurousness. Teacher education, he claims, needs to change in order to develop individualistic, reflexive teachers with the necessary skills and knowledge to meet the challenges of the future.

## 2.8 SUMMARY OF PART ONE

Analysis of the philosophy underpinning environmental education reveals SCT with the emphasis on sustainable use of the environment - the New Environmental Paradigm (Fien 1993). An analysis

of government documents reveals a similar philosophical foundation. It is therefore argued that environmental education and its related methodologies is the most appropriate model for the re-education of teachers in preparation for OBE since this will have the added advantage of meeting the call for education to develop an environmentally literate citizenry.

In order to develop environmentally literate citizens, teachers should be encouraged to build into their curriculum, action-based projects using a constructivist approach and located within the immediate environment. However, few teacher education institutions in South Africa have, in the past, given their student teachers the necessary skills to do this. If the philosophy of the new education policy is to be translated into practice, then student teachers and teachers in the classroom require re-education into appropriate teaching strategies, such as those suggested by Prawat (1992) and Higgs (1990). I have argued above for EE as the most appropriate way of fulfilling the values and principles for Education and Training, since the two are so similar. The next part of this chapter describes an in-service teacher education course which uses EE as the vehicle for introducing OBE to teachers, the majority of whom come from an educationally deprived background and who were using this course as a means of learning about the environment, learning about OBE and/or upgrading their professional qualifications. If we are to see the paradigm shift called for in the government documents, INSET providers themselves need to become reflective as they work alongside teachers and encourage them to change.

## PART TWO

### 2.9 THE EE COURSE

The Rhodes University Certificate and the Gold Fields Participatory Course in Environmental Education for Teachers and Teacher Educators was offered for the first time in 1997. I was involved in part of the first year of a proposed two-year Further Education Diploma offered by Rhodes University, Grahamstown. The course syllabus and the intended outcomes were carefully planned and adhered to, but the details of each workshop were subject to modification in the true spirit of constructivist teaching. The course organisers were involved in action research, and so each day of each workshop was evaluated and reflected upon before proceeding with the detailed planning for the next workshop. The teaching approach was characterised by the following principles:

- acceptance that teachers and students are co-learners
- constructivist approach to teaching and learning

- full participation from learners and teachers
- active use of critical thinking
- an action research orientation to teaching and learning programmes: plan, act, reflect, re-plan, act, reflect, etc.
- continual assessment based on a variety of criteria which are negotiated with the students within a frame decided by the course organisers (in order to fulfil university requirements)
- sharing ideas with others, learning to adapt where necessary
- a teaching programme that reflects South Africa's new OBE Curriculum 2005
- a wide variety of teaching practices, incorporating activity-based learning
- teaching and learning must be fun and be liberating.

This course incorporated the methodology of SCT and OBE. It seemed to me that the curriculum was planned along the lines suggested by Hungerford and Volk (1990) and I was interested to see if this method of educating for the environment was suited to teachers in South Africa. My role was not that of an evaluator of the course itself, but of the effect of the various activities and readings on the students. Six workshops of two to five days were planned. I attended four workshops for the purpose of collecting data for this research, but I attended the remainder in case I could learn more from my participants. I describe the research in Chapter 3.

## CHAPTER 3 RESEARCH METHOD IN SOCIAL RESEARCH

### PART ONE

#### 3.1 RESEARCH PARADIGM AND TOOLS

“Different people may experience and perceive the same events differently” (Jackson 1995:9). I wanted to be involved in the research, and for this reason I felt that the Positivist approach was not appropriate. I did not believe that I would discover “Truth” which I could generalise to all teachers, and I had no intention of experimenting with the teachers who agreed to be part of my research. Rather, I wanted to try to understand the meanings that the teachers made of their experiences on the EE course. I wanted to take into account my own perceptions as an in-service provider. I felt more at home with the philosophy of Socially Critical Theory, which would allow me to use a variety of research methods of a more qualitative nature - what Ely *et al* (1991) also refer to as interpretative, naturalistic or ethnographic research. I prefer not to use “ethnographic” as, to me, this word implies the study of societies or cultures, and I was not involved in that branch of social research. I use “qualitative”, “interpretative” or “naturalistic” interchangeably because I am researching with people in a natural setting where nothing is predetermined, and I am seeking to understand their interpretation of events in their lives and see how well it correlates with my own (Guba and Lincoln, 1983: 317). As a result of years of experience, I had formed some ideas on how INSET could be more effective, and was hoping to have these corroborated, but I went into the research with an open mind, rather like going on a holiday to a known place, but being open to new experiences.

I chose to do a case study in educational action research (Cohen & Manion, 1994), and this research forms the first cycle (McNiff 1992:27), in which I hope to raise issues which could then be researched further in INSET programmes. My reason for this choice is that a case study allows me to work closely with a small group of teachers, become part of their world, as a friend, and so hopefully gain an understanding of the changes they are experiencing as they participate in the Goldfields course. Unfortunately, the nature of action research means that at this first stage, I am unlikely to pick up anything more than pointers which could inform the next stage.

One implication of choosing this research is that I, as the researcher, need to take into account the fact that the majority of my participants come from a different cultural group to me and therefore

are likely to hold slightly different views of reality to me. I claim this as a strength of this research, since the majority of teachers with whom I work on INSET programmes come from the same cultural group as my participants. I felt I needed to negotiate a new understanding of how the participants made meaning of the experiences they had on the EE certificate course, and which aspects of the course helped them construct a new reality about OBE.

### 3.2 THE CASE STUDY

The case study which allows the collection of detailed information specific to the case is more appropriate for the generation of theory, not to test a theory, which was what I intended. Using the case study meant that any hypothesis I had formed before the study began could be reformulated as reality was uncovered, and could then form the starting point for research in another context, or with different people. Hopkins (1985) summarise the advantages and disadvantages of the Case Study as follows:

Table 1: Advantages and disadvantages of the Case Study (p 81).

ADVANTAGES	DISADVANTAGES
<ul style="list-style-type: none"> <li>• a relatively simple way of plotting the progress of a course or a pupil's or group's reaction to teaching methods</li> <li>• information yielded by case studies will tend to give a more accurate and representative picture than will any (other) research methods...; case studies draw on data gathered by many methods.</li> </ul>	<ul style="list-style-type: none"> <li>• in order for the case study to be of value it must be fairly exhaustive; this means that it will be time consuming in its preparation and writing</li> <li>• feedback available to (researcher) only after considerable lapse of time</li> </ul>

I chose to be a participant observer. By this I mean that I attended the workshops with the teachers, where I was sometimes a student, sometimes a helper and sometimes an observer. I was, in a way, using myself as a data-gathering tool (Ely *et al* 1991), so that I could relate my experiences to those of the teachers and thereby hopefully gain a clearer understanding of the meaning they made of their experiences.

### 3.3 RELIABILITY AND VALIDITY IN CASE STUDIES

Doing interpretative research presents dual problems of reliability and validity - particularly external validity as understood from the positivist view point. For example, it is highly unlikely that the findings from so few respondents can be generalised to the broader public, as required by scientific

research. I do not support this view, siding rather with O'Dea (1994), who offers an alternative viewpoint. She claims that since narrative research is looking for interpretative descriptions in detail, validity, reliability and generalisation are not relevant (p 162). Rather, since people do share common experiences, one person's experience can be taken as "truth" and be meaningful to many others. In other words it has external validity and it may be generalised. Guba & Lincoln (1983) claim that by asking the people concerned if the findings accurately reflect their understanding, establishes credibility (internal validity). For the interpretative researcher, research conditions cannot be replicated and therefore interpretative research cannot be reliable in the positivist sense. Furthermore, I am not intending to find answers - only to tease out issues or trends which could then be explored further. This criticism is, in my opinion, outweighed by the depth and wealth of information I can gain, and by using a variety of data sources, and reflecting on the process, credibility can be maintained.

### **3.4 SURVEYS - THE RESEARCH TOOLS IN SOCIAL RESEARCH**

The tools most commonly used to gather interpretative data are surveys using questionnaires and interviews (Cohen and Manion (1994). There are, however, other instruments which I believe have the capacity to generate a great depth of information. These are the concept map, the narrative and the reflective journal, all of which can contribute to the research methodology most closely associated with SCT which is Action Research (Carr & Kemmis 1986, M'Niff 1992). Before describing the process of data collection, I will deal briefly with the strengths and weaknesses of each of the tools as I experienced them.

#### **3.4 1. QUESTIONNAIRES**

Questionnaires, which may either be conducted by post or administered personally to the respondents, have the advantage of being easy to administer and allow the respondents time to consider their answers. However, other valuable information is lost, such as body language, tone of voice and facial expression. They are useful for gathering factual information, which can be coded for easier interpretation, but not as useful for collecting more insightful knowledge. To overcome this limitation, I used open-ended questions, but again, there are disadvantages. Often the researcher would like to probe some of these answers further, and is unable to do so if a postal questionnaire is used. I chose to use questionnaires because my respondents were accessible enough to speak to about answers which I did not fully understand, I felt that by giving them time to read and answer the questions would remove the stress of answering questions in their second

language, and result in a greater depth of information. In addition, I had few enough participants to make this method feasible.

### 3.4.2. INTERVIEWS

An interview can be described as "... a purposeful conversation between two people (but sometimes involving more) that is directed by one in order to gain information" (Ely *et al*, 1991:58). The strength of the interview is that I was able to probe to get more depth or ask further questions to clear up any misunderstandings. I was able to record facial expressions and body language, and by taping the interview, to listen to the tone of voice used. I found that the interviews often generated unexpected responses which influenced the research question. On the other hand, I had to be careful not to allow my subjectivity to influence the interview, whereas this is unlikely to happen if a questionnaire is used (Cohen & Manion 1994:308). Using interviews required the respondents and me to meet, they were very time consuming to transcribe and not as easy to analyse as questionnaires. They also had the problem of generating so much data that are interesting, that it was not easy to decide whether to ignore titillating "red herrings" and focus on the goals of the research, or allow the "red herring" to lead the research on a totally new, but fascinating track. Although I followed a few red herrings out of interest, I chose to focus on my original goals of the research proposal in writing up the thesis.

### 3.5 REFLECTIVE JOURNALS

A reflective journal can be used to record the writer's interaction with a text being read, their reaction to experiences of learning and teaching, or thoughts and feelings about situations in life. In short it records the meanings the writer attaches to experiences (Biddle, 1997).

Reflective journals, if used properly, are similar to the narrative in the depth of information they can generate, and have the advantage of being developed over time, as part of the learning process. This means that each step is recorded rather than a broader overview which one gets from the narrative. A further advantage is that I could read the journal when time permitted and it did not require the writer to be present. I consider the narrative and the reflective journal as complementary to each other and useful tools in triangulation of results.

Guba & Lincoln (1983) claim that a naturalistic researcher will enter the field with a broad design and "anticipate that the design will emerge as the inquiry proceeds" (p325). I found this to be true. I

chose to include two other tools, only after I had begun to analyse the first data. I chose to include narratives and concept maps.

### 3.6. NARRATIVES

The use of a narrative allows the person to tell her story in her own way. Cohen and Manion call this kind of data gathering Accounts and Episodes (Cohen & Manion 1994:243). I prefer to use “narrative” as it implies a story of many episodes in a person’s experience. The advantage to me as a researcher is that the narrator highlighted the aspects of the story which are most meaningful to her, and this gave me a deeper insight into her world, as Hart (1996) claimed:

*Stories are probably authentic expressions of teachers’ values precisely because they are formed both in action and in intuitive perception, thus eliciting memories of stored knowledge through not only cognitive processes, but also through moral, spiritual and psychological ones. (Hart, 1996:35)*

The narrative can therefore be used as an extremely rich primary data collection tool, where the researcher will need to verify the authenticity of the story by various means, or it can be used as I chose to - as a means of authenticating data collected by other means, i.e. as a means of corroborating evidence, and of counteracting any subjectivity in interpretation of those data on my part.

The context in which a narrative is recorded is important so that the narrator is able to relax and concentrate on what she wishes to say, without extraneous interruption. While care needs to be taken not to limit or control the information, I felt that as I was to use the narrative as a corroboration tool, I needed to establish the objectives of the enquiry, otherwise a lot of information irrelevant to this research may have been gathered. Once I had informed the narrator of the objectives, I felt I needed to communicate only with eye contact, nods of encouragement or agreement and other non-verbal messages, in order to demonstrate my interest, but not influence the narrative in any way. Body language is also important in interpreting meaning, and I noted this as the narrator was speaking.

The main disadvantage of the narrative is that while the depth and richness of information is unchallenged by other instruments, it requires a lot of time for transcription and analysis. I found that as the person related her story, she tended to move her body and this can result in some loss of

clarity on the tape. To overcome this I transcribed the tapes as soon as possible after the event, and gave the transcription to each narrator to check, and alter if they so wished.

### 3.7. CONCEPT MAPS

According to Novak & Gowin, (1984) knowledge is constructed through our experience with natural and man-made objects or events. These objects or events are represented by symbols - language. The words we use to describe these events, will conjure up in our minds a picture of the object, as we have experienced it or the event as we remember it. We call these “concepts”. Learning involves linking concepts together in more and more sophisticated ways as our experience grows. Learning is an individual activity; it cannot be shared. We share the meanings we construct, we negotiate these meanings so come to socially constructed consensus. (Novak & Gowin, 1984:20).

Novak (1991) defines a concept as: “a perceived regularity in events or objects, designated by a label. Two or more concepts linked together form a proposition or statement about something in the world that occurs naturally or has been constructed by people” (1991: 45).

White and Gunstone (1992), building on Novak’s work, claim that full understanding of a phenomenon requires factual knowledge, as well as a mental image of this knowledge and some memory of experiences and procedures related to it.

*The richer the set [the more facts, images and experiences], the better its separate elements are linked with each other, and the clearer each element is formulated, then the greater the understanding (White and Gunstone, 1992:5).*

However, they point out that since each person perceives reality differently, it is not easy to rate a person’s understanding. It has, of necessity, to be a subjective process. For White and Gunstone, understanding is “ a function of the number of elements of knowledge the person possesses about the target..... and of the pattern of associations that the person perceives among them” (p. 13). In other words, people construct their own meaning. This, they claim, can be done in three ways:

- by reflecting on knowledge already held, when new links may be forged - the “Ah-ha, now I understand!” phenomenon;
- when learning occurs in a situation where it was not expected - incidental learning, and
- under the guidance of a teacher.

Each person's constructs are unique in detail. Ballantyne and Packer (1996) claim that the concepts an individual holds influence the way they interact with the world (1996: 27). This was what I was probing, in the hope that my findings would allow me to gain some understanding of how the map-maker made meaning of her world (White and Gunstone, 1992), as well as allowing me to probe for deeper understanding, by following up with an interview (Leat & Chandler 1996).

A concept map is a constructivist tool for organising meaning. Novak & Gowin (1984), define a concept map as " a schematic device for representing a set of concept meanings embedded in a framework of propositions" (Novak & Gowin, 1984:15). A concept map is made by arranging cards, on which concepts are written, in a meaningful way, on a large piece of paper. Once satisfied with the arrangement, the cards are stuck onto the paper and lines drawn to link the various concepts. The nature of the link is written on the line, and arrow heads may be used to show this more clearly. The value lies in the written links, for without them, the map has little meaning. "When concept maps are conscientiously constructed, they are remarkably revealing of student's cognitive organisation" (Novak & Gowin 1984:35).

There are many advantages to concept maps. Those pertinent to this research are :

- they are quick to make, once the maker has grasped the process;
- they show misconceptions, or where new learning is needed;
- they do not require an extensive use of language, which is a bonus for second language speakers who have an opportunity to think through their learning and organise their thoughts;
- they focus on links that the maker perceives, not on those of the reader;
- they can be used to probe understanding in subjects that are not easy to test theoretically;
- they can be used at any time, e.g. to check understanding of an aspect of a learning topic, to encourage learners to make links between different topics, to help learners incorporate new concepts into their understanding;
- they promote learning by revealing where rote learning has occurred;
- concepts can include emotions as well as facts or events;
- they can be supplemented by interviews;
- there are no "right" answers. They allow an exchange of views on why links are seen as good and valid;
- they can be made and compared over time to see how understanding changes with time.

(White & Gunstone, 1992, Novak & Gowin, 1984)

The disadvantages are that they do not reveal all the links and ideas that the maker has, and, as I found out, require practice in order to produce quality maps with many links. I chose to use the concept map to see whether it supported findings from other tools.

The five tools described above were used critically, particularly the reflective journal, the narrative and the concept map. By this I mean that I not only used them to collect or corroborate data, but I also considered their value as research tools in interpretative research. I will comment on this in Chapter 6.

### **3.8 ETHICS IN INTERPRETATIVE RESEARCH:**

Ethical problems arise when doing social research. I had to be aware of the problems of subjectivity and of power (Firth 1996). I did not want to be in a position of power, such as I would be if I was doing scientific experiments, and so I made a point of becoming friends with the teachers. I did not want them to feel that they were being “tested” and should therefore tell me what they thought I wanted to know. I wanted them to understand that they, in fact, were the teachers and I the learner. People are not objects and may not be treated as such. It was important that I conducted research **with** my subjects and not **on** them (Cameron 1992). This meant that I needed to gain the informed consent of the participants after explaining the broad aim of the research project to them, and the use to which the findings would be put. I needed to explain that they were free to leave the project at any time, and assured them of anonymity and confidentiality. I asked each teacher to read everything I wrote concerning her, as well as the final text before publication to make sure that it was a true reflection of their experiences (Cohen & Manion, 1994: 347 - 359, Lather, 1986).

## **PART TWO: DESCRIPTION OF THE RESEARCH**

### **3.9 THE RESEARCH TEAM**

I was in an unusual position of almost having my participants choose me! I had no idea who would be joining the EE course. I had to wait until the first workshop, and hope that some of the students would be prepared to join me, and that these teachers would not live too far away from me. As it happened, three students phoned me requesting lifts to the workshop, and so I met two of them before the workshop, and was able to ask them to join me in my research. The third teacher found her own way to the workshop (I had no room for her in my car) and I was able to ask her to join me during the first evening.

The three teachers, from the same school, were all primary teachers, one of whom taught Grade 7, in which Curriculum 2005 was to have been implemented in January 1998. Of the two other, one was the Principal, and taught Grades 5 and 6 in one classroom, whilst the other taught Grades 3 and 4 together. This school was close enough to my home to allow me to visit, and spend time with the teachers between workshops. The INSET provider, who was a colleague, asked to be part of the team and this allowed me to get another perspective on the impact of the programme from the INSET provider's point of view. The non-participant observer was a Wildlife Society Education Officer, who ran an Enviro-Club at the school, and who had been involved with the teachers for some time, and through whom they had first heard about the EE Certificate course. I felt that she would be in a position to give me an objective view of any change in the teachers, and could thereby corroborate or not the teachers' own perceptions of how they had changed.

### **3.10 COLLECTING DATA:**

#### **3.10.1 QUESTIONNAIRES**

##### **3.10.1.1. SETTING A BASE-LINE:**

In designing the first questionnaire, I bore in mind the findings of Sia *et al* (1985/6) who claim that people who are environmentally active are those whose upbringing and personality play a considerable role. I made the assumption that people who choose to embark on an EE Certificate course as a way of upgrading their qualifications, must have some understanding of and feeling for the environment. The pre-course questionnaire was administered to the participants to ascertain their understanding of EE and OBE and what they expected to gain from the course. I expected this to give me a base line from which to measure any changes in perception regarding OBE and the value of using the local environment as a means to introduce outcomes-based teaching methods from an EE perspective. Winter and Reddy (1996) had used a similar approach in the research they conducted with their students and by using similar questions I hoped to be able to compare my findings with theirs. (These findings would only become available at the end of the year, and therefore fall outside the scope of this thesis.) The participants were interviewed during the first session to clarify points raised in the questionnaire.

##### **3.10.1.2. ASSESSING CHANGE:**

I assessed any change by means of questionnaires, backed up with informal interviews, and used the journals, concept maps and narratives for triangulation purposes. The second questionnaire was administered before the second workshop to assess the impact of the "Opening Windows"

workshop on them and how they thought they had changed as a result of their field experience. It also aimed to ascertain whether there had been any change in their teaching style as a result. To measure their understanding of the theoretical aspect of the workshop they were asked to create a concept map. Their journals were also read to give me guidance in preparing the third questionnaire. The third questionnaire was administered before the third workshop to gather information on how well the participants had been able to understand and use the theory which was covered during the second workshop.

Between each workshop, I visited the teachers at their request, at their school and we talked about the assignment they had to do and discussed problems. On one occasion, I shared information on the use of journals in teaching and learning which I had received at a workshop held in East London, and because the teachers found this very useful, I offered to repeat it at the third Certificate workshop. On another occasion, we had a tutorial on some of the readings with which they were having difficulty. These were by way of “scaffolding” the teachers, who were finding difficulty with the level of some of the readings, and who had never done research before. In the course of informal conversations, I learned more about the teachers, their lives and their teaching practices. The journeys to and from the workshops were often used to discuss the assignments and what we had experienced during the workshops. Just prior to the fourth workshop, each participant was asked to make a second concept map. I photocopied each participant’s journal and recorded their stories on audio tape.

Unfortunately, the time constraints of the Master’s degree prevented the inclusion of any further data. However, I remained with the Certificate course and interacted with the participants throughout the final two workshops, adding data to those I have presented here. I kept a journal throughout the course, recording my impressions of the various activities, students’ responses to the experiences and theory presented, interesting anecdotes garnered in informal conversation with other students and ideas for an INSET model.

### **3.10.2 CONCEPT MAPS**

In the pre-course questionnaire, I had asked the participants to give their understanding of the term “environment” and of “environmental education”. In Workshop One, the participants had been exposed to the following:

- ideas of an holistic environment

- constructivist learning
- environmental education FOR the environment
- knowledge
- learning theories
- environmental crisis and responses
- activities and videos aimed at helping develop caring attitudes towards the earth.

Rather than ask a lot of “What do you understand by...” questions, I decided to ask the participants to make a concept map using certain environmental concepts, and with blank cards to add in other ideas they felt necessary. The respondents were given an unrelated example of a concept map to remind them of how they are constructed, A3 paper, the concept cards and glue, and asked to construct one. The second concept map was concerned with theories of learning and OBE.

The two maps were kept and at the end of the course the participants were asked to make each one again. The maps could then be compared by the respondent herself, and any change ascertained.

### 3.10.3 THE NARRATIVES

In order to give the narratives some direction, I decided to ask all four participants to base their story on the same plan, and then, based on what I had extracted from the questionnaires, or what was raised during the narrative itself, I asked each one for a different ending. To increase validity and maintain a high ethical stance in the research, these conversations were transcribed, analysed and interpreted, and my interpretations given to the participant to verify or change before inclusion in this research thesis.

Each person received an invitation to tell me a bit about her background, why she had chosen to take the course, what she thought she was like as a teacher before she started on the course, and how she thought she had changed over the six months. I then asked her to tell me what she thought had helped her to change. I chose to tell them what I wanted to know, in advance, so that they could reflect on the six months. I did not tell them what I was going to ask after that. I got permission to record the conversation, and planned to treat each participant to a relaxed meal, before we sat down with a cup of coffee to make the recording. Once I had transcribed the conversation, I asked myself the question: To what extent does the narrative support what I had interpreted from the questionnaires and journal records?

I completed the research by interviewing the non-participant observer, but indulged my curiosity by following a “red herring” and asking the Grade 1 and 2 teacher, who had not been enrolled for the certificate course, to write her story for me, telling me what she had gained from the other teachers.

## CHAPTER 4

### PRESENTATION OF DATA

#### 4.1 INTRODUCTION

In the last chapter I discussed my choice of methodology and the tools I would use. In the next two chapters, I present the data. Chapter 4 and 5, although separate, should be taken as a whole. I felt that since I am acknowledging my subjectivity, I needed to include my reasoning behind the questions I asked. This I do in Chapter 4. As each of the sets of data were collected, they were recorded, analysed and inferences drawn, but I found that this resulted in a large number of “bits” of information and there was a risk that I would not easily be able to see correlations and mismatches in any one person’s data. I therefore entered all the data on a grid which I drew on an A<sub>1</sub> size sheet of paper, as shown below, and was able to synthesise the data from each respondent into a story. These stories, together with my analysis and commentary, are presented in Chapter 5, and include triangulation from the journals and narratives. I have therefore not duplicated the data in Chapter 4, but I do make general comments where necessary, and give a summary of the findings of each tool. The concept maps presented a challenge, as I found it necessary to convert a visual image into a verbal description. I have therefore included my interpretation of each map, which has been read and agreed to by each participant.

Table 2: Grid used to organise data prior to analysis

	Carol	Phumla	Sibongile	Zibi	April	Thandeka
Pre-questionnaire					-	-
Questionnaire 2					-	-
Concept Map 1					-	-
Questionnaire 3		-			-	-
Concept Map 2		-			-	-
Questionnaire 4		-			-	-
Journal		-			-	-
Narrative		-			-	-

Each person signed acceptance as a participant, and agreed to allow me to read their journals. They completed the first questionnaire before the first workshop, and I used a semi-structured interview to clarify those responses which were not clear. The teachers are Zibi, Phumla and Sibongile. Carol is the INSET provider.

## 4.2 PRE-COURSE QUESTIONNAIRE

*To collect baseline data for comparison*

1. How long have you been teaching? *I want to know what experience each person has and get some indication of the kind of teacher education they may have received.*

Zibi's Phumla's and Sibongile's experience ranged from 4 to 25 years. I found this interesting as it meant that I was working with people who had been at College before the 1976 troubles in education and at a time when College students tended to accept the education they were given, through to a teacher who had been at College at the height of the student unrest around the time of the change in government. This raises two questions: would the younger teacher who had been exposed to dissonance at her College of Education find it easier to adapt to the new ideas in education, and would the older teacher find the change in education more stressful? Seeking the answer to these questions would form part of a narrative towards the end of the research period. Carol had taught for more than 15 years, of which 8 has been in-service teacher education in what was formally Ciskei.

2. What subject/s and standards (Grades) do you teach? *This will give me an idea of the age range of pupils and how busy the teacher is - does she already have opportunities within the current syllabus for fieldwork etc. The subject taught may have an influence on the extent to which she may feel she can utilize EE in her teaching.*

3. Does your school do something special to commemorate any of the following? (Tick those that apply). Arbor Day, World Environment Day, Water Awareness Week, National Marine Day. *I want to find out whether the teacher is aware of "environmental" commemorative days and whether the teachers have support from their school.*

4. Which of the following activities (if any) would you like your school to take part in on a regular basis: Tick your choice/s -Recycling of paper, glass, plastic and aluminium; cross-curricular activities and anti-litter campaigns. *Again, I want to find out what support the school gives.*

Please explain why you feel your school should take part in these activities: *I hoped that this would give me more insight into the teachers' attitude to the environment.*

5. Do you use your local environment as a teaching resource? Explain.

*This will give an insight into what the teacher considers the local environment to be, and whether she is already somewhat environmentally literate.*

6. In 1998 outcomes based education (OBE) will be introduced. How good do you consider your understanding of the following to be: (Poor/Moderate/Good) Outcomes; Values and attitudes; Skills; Group-learning techniques; Continuous assessment; Constructivist teaching methods; The use of journals and portfolios in assessment. *This is simply a baseline question. I will ask it again*

*to see if there is a change. The respondents will be using journals and developing their own portfolio during the course. As the entire course is organised on constructivist theories, I expect to see a change in perception by the next workshop.*

7. Why have you chosen to participate in a course of study in Environmental Education? *I want to know their expectations of the course and if they feel a nagging concern for the environment, a need to change their teaching style etc. I will refer to this at the end to see if the expectations were met.*

8. Complete the following: To me, environmental education means:

*This will give me a base measurement against which to measure any change in conceptualisation after each workshop.*

9. When you take into account the readings and assignments you will do, how much extra work do you think this course will involve? *I hope to find out what the students think will be expected of a certificate course.*

10. How do you hope the course will help you in terms of (a) your personal growth.

(b) your professional growth?

*This is another baseline question to which I can refer at the end for the teachers to give a personal assessment of their growth.*

#### **4.2.1 SUMMARY AND REFLECTION ON QUESTIONNAIRE ONE**

Constructivist learning theories accept that we all have prior knowledge, values and attitudes constructed as a result of our experiences, and that learning requires a reconstruction of this prior knowledge to incorporate new experiences (Vygotsky, 1978, Ransom *et al*, 1996). The purpose of this questionnaire was to document the pre-course constructs of each participant so as to set a baseline to which we could refer in order to discern whether any change in knowledge, values and attitudes towards EE and OBE occurred over the course of the EE course.

#### **4.3 QUESTIONNAIRE 2**

This questionnaire was based on the participants' experiences during and after Workshop One of the EE course. It was given to them to complete in their own time before the second workshop.

#### **SECTION A**

This section aimed to find out what affect Workshop One had on each person, and how they were coping with their studies.

1. To what extent did the walk through the reserve, and the activities such as drawing, collecting leaves and interesting items help to “open windows” and make you aware of the local environment? *In terms of a model for INSET, I want to know if giving people an experience of the environment before any teaching occurs, is an effective way of “opening windows”, or as Orr (1992) puts it, developing an “I care” attitude. .*

2. Different coloured bins were used for recycling food, glass, paper and cans. Have you started doing the same? Please explain your answer.

*We all used the bins, and saw how effective they were. I have not sorted my refuse to that extent (although I know I ought to separate cans), and I want to know if people’s attitude changed after the first session.*

3. We were shown a number of videos about the environmental crises facing the world. What do you remember most about them? *Here again I am seeking to find out if there has been an attitude change.*

4. What did you think the point of the “Shopping” game was?

*When we did the “shield” activity as an ice-breaker, a lot of people stated that they would save material goods from a fire. In playing the shopping game with a group, I was aware that each person assumed that they were playing for themselves, and an “I’m all right, Jack” attitude became clear. Some people in my group said they began to feel a bit guilty after the discussion. I’m interested to see if that perception has remained.*

5. What did you think Noreen’s role was during session one?

*Was I seen as one of the ‘authorities’, or a resource, or a mentor? Is it helpful to have such a person?*

All respondents saw me as an observer of the course, and someone who would help when needed. From this I gather that they did not see me as in authority, and therefore could relate to me more easily. Ely *et al* (1991: 45) quoting Wolcott (1988) refer to this role as that of “the privileged observer ... who is known and trusted and given easy access to information about the context” This “friend” role was enhanced by visits to the school, where I would share thoughts with them and discuss the teachers’ problems. I was a co-worker for Carol- someone to discuss and share thoughts with. I was careful never to come across as someone who had the answers, but rather as someone who had experience to share, and sought to gain from their experience as well.

6. Looking back at the first session, what TWO aspects affected you most?

*I put this in for guidance for an INSET programme. Of course I could get answers like “The snoring at night”, or “I had to sleep on the floor”, and so I have asked for two aspects.*

7. How have you organised your time to work on the material you were given?

*All the participants are very busy people, and making time for study after hours is not easy. I want to know whether they planned their work time, or fitted it in where they could. This has implications for the planning of an INSET programme.*

8. What are you hoping to get from the next session?

*I hoped that by asking this question, I would gain insight into what the teachers saw as a natural progression from the mainly practical first workshop. This would give me guidance for an INSET programme.*

## SECTION B

The second section of this questionnaire is to find out to what extent the first session has affected the way you teach.

9. Which of the following have you been able to use in your teaching: (Walking in the local environment, the blindfold game to sharpen senses; collecting items of interest and making a concept map; the shopping game; the woolly web game; the Enviro-facts leaflets; designing a fieldwork exercise; videos; group work.)

*In the Pre-course questionnaire, I asked the participants if they used the local environment, and they all said "yes", (although the teachers seemed to rely on the Wildlife Society Education Officer to organise these outings). Now I am asking the same question from the point of view of the first session. My reasoning is that if the activities had an impact on the teacher she would want to incorporate them into her teaching as soon as possible. If this had happened then it could imply that the teacher is willing, at this early stage, to break from the mould of the past and begin to include some innovative teaching techniques. It would then be necessary to give the teacher support and encouragement. If not, then it could imply that the teachers needed a more structured guide to the implementation of constructivist teaching methods, and ongoing support.*

10. This question is a repeat of question 6 in Questionnaire 1, and will be repeated again. I want to see if there is a change in perception, and how soon it occurs.

### 4.3.1 SUMMARY AND REFLECTION OF QUESTIONNAIRE TWO

All participants indicated a degree of change in knowledge. The teachers had liked the alternative teaching strategies demonstrated enough to try some of them. It is not possible to ascertain whether this indicates the beginning of a change, or is simply a testing of different methods.

#### 4.4 QUESTIONNAIRE THREE

This questionnaire was given to the respondents before the third workshop, allowing them time to respond (and read the texts, if necessary). Phumla had by now dropped out of the course.

##### HOW HAVE YOU GROWN SINCE WORKSHOP 2?

Workshop 2 centred around the environmental crisis facing the world and the need for environmental education. We then moved on to look at the views of knowledge and education, particularly those underpinning the Apartheid education system.

*Etchberger & Shaw (1992) and Prawat (1992) claim that to effect change, teachers must become dissatisfied with their present beliefs, and then be presented with alternate beliefs. I want to see if my participants have reached the stage where their experiences and reading have made them feel dissatisfied. They have already had a taste of outcomes-based teaching, they have tried some of the activities they themselves experienced and I want to find out if they have internalised the theories underpinning OBE.*

1. Please explain how your present understanding of what KNOWLEDGE is and how LEARNING takes place, fits with the story that Ursula told in the notes? *This is partly to see if the participants have read the core texts (van Harmelen, 1997), and understood them, and to focus their reflections on where they have come from, and partly to see if any of them felt that they held different views to those presented by Ursula, before coming on this course.*

2(a). Did what you read help you to understand the reasons behind the kind of education you received? Yes / No. Explain your choice. *Have they, in fact understood where we have come from?*

(b) Does the way you teach now show any similarity/difference to the way you were taught? Explain. *Do they feel disempowered and unable to change on their own, are they lazy to change, or quite content with the old ways?*

3. How did you **feel** when you had finished reading about Positivism, Behaviourism, and Fundamental Pedagogics? Why? *I am wondering if they will express a degree of dissatisfaction. If not, then I hope to find out why they do not yet feel ready for a change. (Prawat, 1996 warns that change is slow and takes a very long time.)*

4. EE is seen as the way to make sure the world is fit for our great-grandchildren to live in. What did you learn about EE that made the greatest impact on you during Workshop 2? *I want to see to what extent the aims, the objectives and the guiding principles have been understood and internalised.*

5(a). What effect on you did reading the articles on Continuous Assessment have? *Continuous assessment is central to OBE. If my participants felt excited or challenged then I hopefully can expect to find that they begin to use CA. If they find it daunting or confusing, then I think I may assume that they need more time to help them understand what it entails.*

(b) What link is there between Continuous Assessment and OBE? *This will show me whether they understand that the way we assess affects our teaching and can make it become outcomes-based.*

6(a). Thinking back to where you were before this course started, then over the workshops until now, in what ways do you think you have changed? (b) What helped you to change? *I have included this question to encourage the participants to reflect and to actually state how they think they have changed. This will also allow me to see if there is a correlation between their Journal, their Narrative and what they claim here.*

#### **4.4.1 SUMMARY AND REFLECTION OF QUESTIONNAIRE THREE**

This questionnaire sought to discover attitudes and feelings which may have changed or become more focused as a result of knowledge gained from reading the core texts which had been given to the students. The questionnaire was administered just before the third workshop, giving the participants time to complete the readings (which they needed to have done in order to cope with the assignment topic). Very few feelings or attitudes were expressed and it was clear that the respondents had either not done any reading, but had concentrated on doing the assignment, or, had needed scaffolding and support in coping with the articles.

#### **4.5 QUESTIONNAIRE FOUR**

The EE course presenters administered a questionnaire consisting mainly of questions requiring respondents to rate aspects of the course as a way of evaluating the course at the halfway stage. With the consent of the course presenters and my participants, I used some of the questions, as a fourth questionnaire. I selected only those questions which had a direct bearing on the goals of my research. I present them in the same form as the other three questionnaires, giving my reason for selecting them, but I include the responses as they have implications for INSET to which I will refer in Chapter 5 .

4. Please indicate your evaluation of the course thus far using a scale of 1- 5: 1 means poor, 5 means excellent. *This will give me an indication of how successful the participants perceive this type of INSET course to be.*

To what extent is/are:

4.1. The core texts of value in providing relevant information.

All three participants found the core texts valuable

4.2 The core texts easy to follow and to understand

One teacher found the core texts very difficult to follow, the others felt they were good

4.3 The core texts helping you to make sense of the readings and activities that are part of the course.

All participants rated the core texts as fair

4.4 The assignments of value in helping you to locate the course in your own situation

The participants found the assignments only fairly valuable.

4.5 The assignments helping you to synthesise the course

Two participants found the assignments extremely useful; one rated them average.

4.6 The journal helping you to make sense of the course as a part of your professional life

The responses ranged from poor to good.

## 5. Self Evaluation

Please let us know to what extent you feel that **you** have met **your** expectations thus far. Indicate where you feel you have come on the “journey” so far by ranking your achievement and growth on a scale of 1 - 5. (1 means no progress, 5 means you are where you want to be). *I had asked for expectations in questionnaire one, so this question offered an opportunity to compare responses.*

How do you rate your progress in:

5.2 The acquisition of knowledge about and for EE.

All participants felt they had made excellent or very good progress.

5.3 Your ability to understand and to contribute to the EE “debates”.

All participants rated themselves as having made some progress, but as still having a long way to go.

5.4 Being able to take a lead in teaching EE in your teaching area.

All participants felt confident about their ability

5.5 The acquisition of knowledge in education theory

Only two participants responded to this question, and they rated their progress as middling.

5.6 The acquisition knowledge (sic) about the changing curriculum

All participants felt they had a good understanding, with one claiming that she felt she was where she wanted to be.

5.7 The acquisition of skills and competencies for teaching in a learner centred situation.

All participants felt they were some way to achieving their goals, but had a long way to go. This could be due to the lack of information available on Curriculum 2005 at present. Other areas of growth mentioned were in the understanding of the holistic view of the environment, and of constructivism.

5.10 Please indicate how you think we can help you to develop further. *I hoped to gain insight into what to consider for future INSET, to help teachers become competent in OBE.*

The participants listed help with writing assignments, having more, and more regular workshops and regular tutorial meetings between workshops.

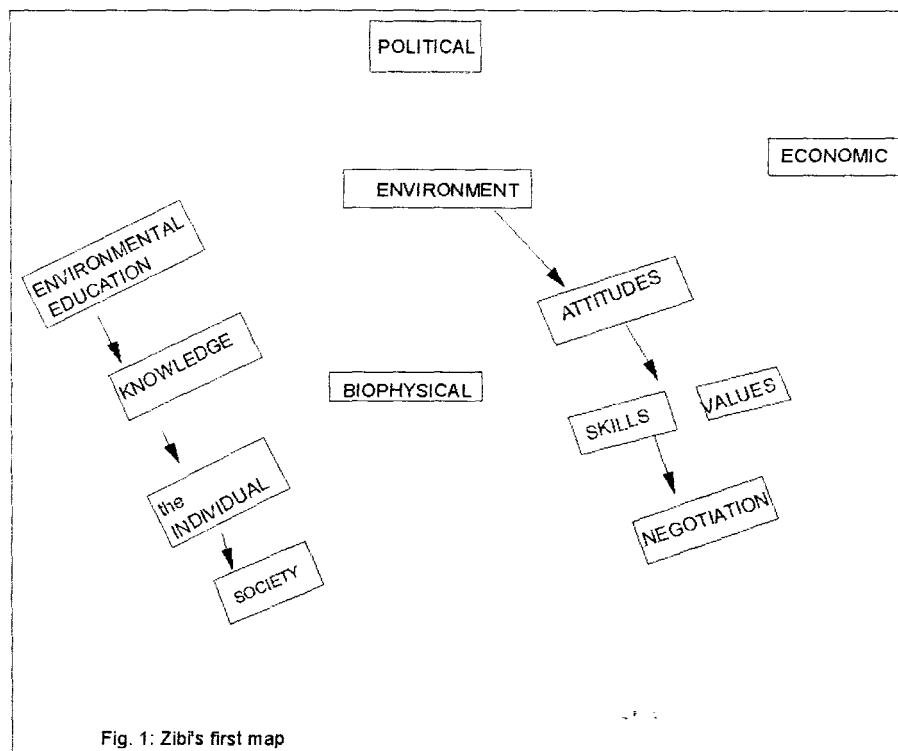
5.11 Please indicate where you think you need to make a greater effort.

All participants indicated that they needed to improve their journal writing.

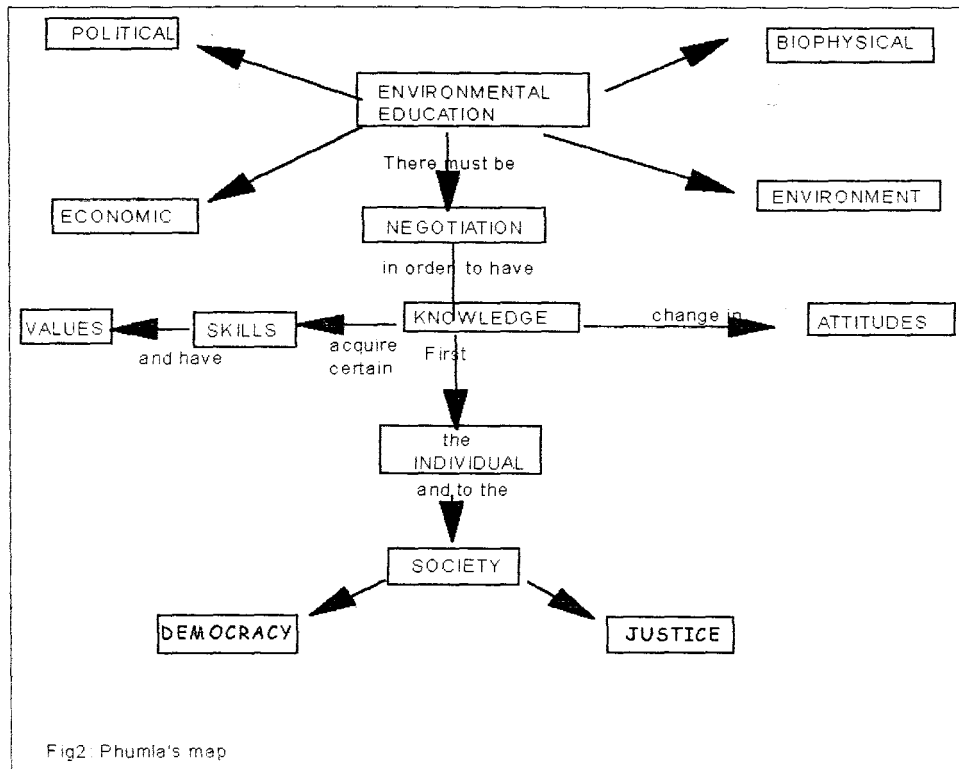
#### 4.6 CONCEPT MAPS

The seven concept maps which were made by the participants during the research period have been copied as closely as possible. For reasons explained above, I include a detailed analysis of each.

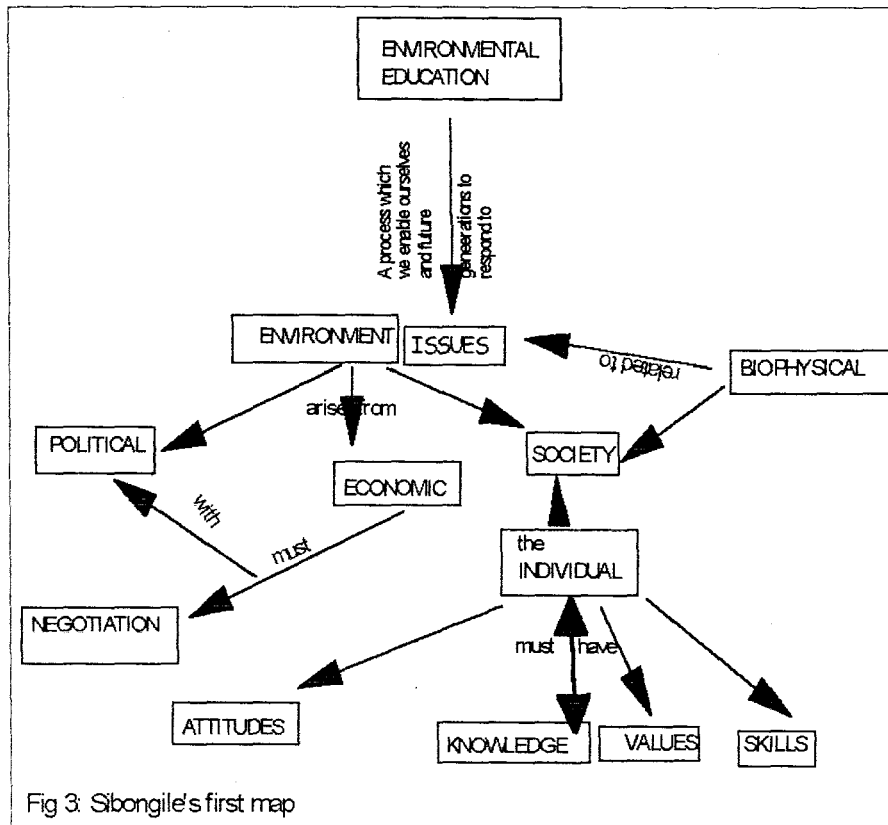
##### 4.6.1 CONCEPT MAP ONE



Zibi (Fig 1) placed the environment at the centre surrounded by economic, political, biophysical and environmental education, but without any links between them. There is some understanding of the role played by the environment in developing attitudes, and of EE as informing society by providing the individual with knowledge, but without the Zibi's written reasons I may not assume my interpretation to be correct and must assume that there is little concrete understanding of the concepts concerned



Phumla (Fig 2), connected EE to the biophysical, the environment, economic and political factors, but gave no reasons. She also linked EE to negotiation in order to have knowledge. Knowledge which she saw as having its source in EE, is first personal, and then passed to society where it results in democracy and justice. Knowledge, she sees, leads to a change in attitudes but can also help to acquire skills and hold values. The lack of written links makes reading the map difficult but I understand that for Phumla, knowledge, which is negotiated through EE, is central. Since Phumla had dropped out of the course, I was unable to ask her to remake this map at a later stage.



Sibongile (Fig 3), saw EE as a process by which we enable ourselves and future generations to respond to environmental issues which arise from political, economic and social factors and are related to the biophysical factors. Society is informed by the individual who must have the necessary attitudes, knowledge, values and skills. She also saw society as needing to have negotiation with political factors, but it is not clear why. I interpret this map as showing an understanding of the holistic nature of the environment, and the need for EE. This is borne out in her narrative (Sibongile Narr: 70-80).



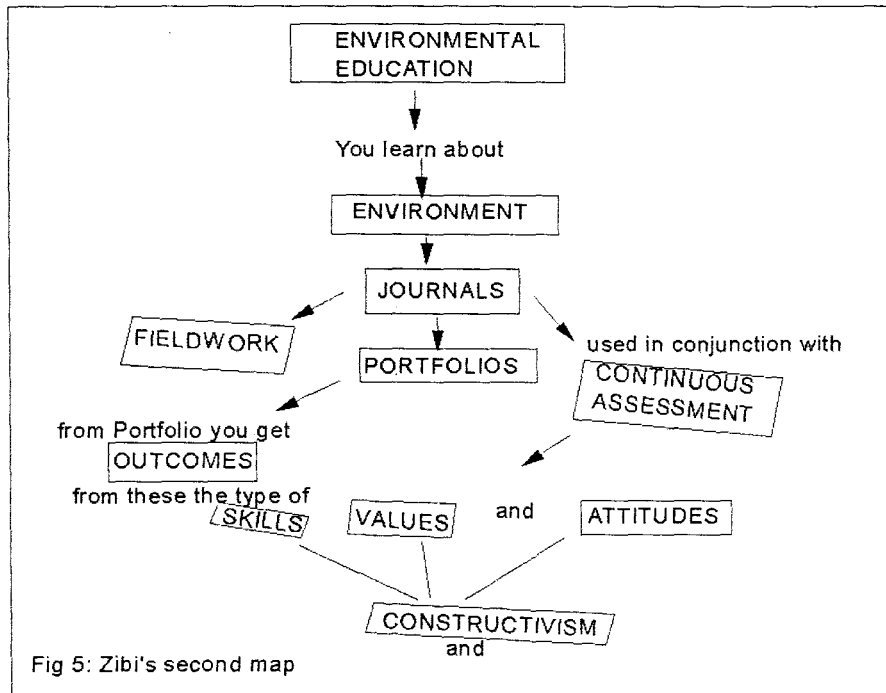
Comparing these results with the comments given in the pre-course questionnaire on EE, (question 8) there has been a change in perception of what EE is. There is also a correlation between the concept map and question 10 of questionnaire 2 in which the respondents claimed to have a changed understanding of skills, values and attitudes. Phumla was the one who claimed to still have a poor understanding of most of the concepts.

Winter and Reddy (1996) cite Duit (1994) as claiming that conceptual change strategies are problematic because students have difficulty in experiencing and dealing with cognitive dissonance. Duit claims that students find it too demanding and will not change unless the benefits of change are sufficiently attractive (Winter & Reddy 1996: 27). Yet Winter & Reddy also cite Ballantyne and Bain (1994) who have shown that it is necessary to use cognitive conflict in teaching in order to motivate learners to grapple with dissonance (Winter & Reddy, 1996: 27). The teachers with whom I am working are having change thrust upon them in the form of Curriculum 2005. The second concept map shows how far these teachers have come to terms with the required change.

#### **4.6.2 CONCEPT MAP TWO**

This concept map was designed to probe the understanding of the teaching, learning and assessment strategies appropriate to EE and OBE. Once again, certain concepts were provided and the respondents allowed the freedom to add others if they so wished. This map was created after the third workshop, at which teaching strategies had been the focus.

Phumla had by this stage decided to drop the course for this year, and start again next year when she would have more time to devote to her studies.



Zibi's second map (Fig 5) showed that she understood EE as the main concept, and from that came knowledge about the environment. This concept was linked through journals to portfolios and fieldwork. No reason for these links was given. From the portfolio she showed a link to outcomes and from these to the kind of skills, values and attitudes, and to constructivism. She understood the portfolio as used in conjunction with continuous assessment. [The use of the portfolio for continuous assessment was dropped during the course of the year.] This map shows clearly the structure of the course as a whole. It is unfortunate that although asked to supply reasons for the links, Zibi added very few. In spite of this it is possible to see that she has gained a clearer understanding of environmental education methodology and philosophy.

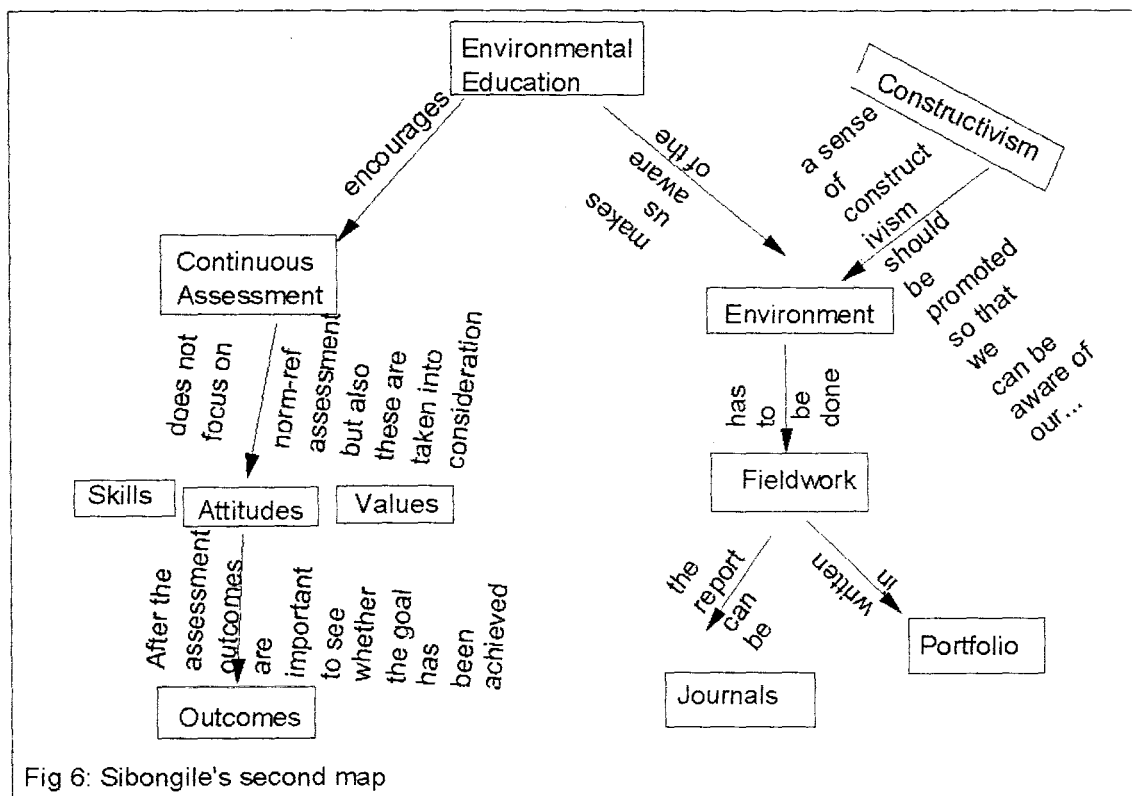
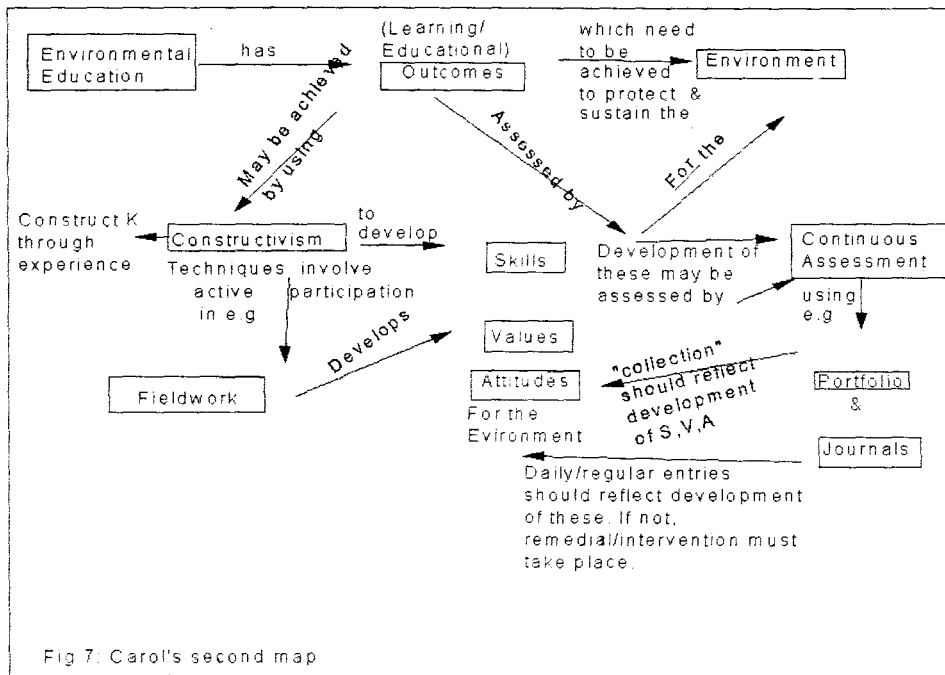


Fig 6: Sibongile's second map

Sibongile (Fig 6) understood EE as making us aware of the environment. However, a sense of constructivism should be promoted so that we can be aware of our environment. Field work has to be done in learning about the environment, and this can be reported on in journals and portfolios. At the same time, EE encourages continuous assessment which does not focus on norm-referenced assessment, but takes into consideration skills, attitudes and values as well, and in order to see if the goals have been achieved, the outcomes of the assessment are important.

The arrangement of the map, in which EE is shown as having two separate components, shows that although there is a much clearer understanding of the concepts, there is still a separation between the environment as linked to fieldwork (outdoors?), and skills, values and attitudes as shown in the outcomes, which are assessed (in the classroom?). Sibongile stated that she still was not sure what constructivism was or where it could fit into the map, but knew it had something to do with the environment.



Carol (Fig 7) saw EE as having learning/educational outcomes which need to be achieved to protect and sustain the environment. These outcomes are assessed by the development of skills, values and attitudes for the environment, and assessed by continuous assessment using portfolios and journals. Portfolios as a “collection” (of work?) should reflect the development of the skills, values and attitudes, while the journal should have daily/regular entries which should also reflect development. If not, then remedial intervention must be done. Carol showed that the outcomes of EE may be achieved by using constructivist (construct knowledge through experience) techniques which involve active participation in e.g. fieldwork, and develop the skills, values and attitudes for the environment.

This map shows a change in perception of EE as an awareness of the environment to EE as educational outcomes to protect and sustain the environment - a change from egocentric to eco-centric thinking (Winter and Reddy 1996:30). There is a clear understanding of outcomes, constructivism and continuous assessment, about which Carol claimed to have only a moderate understanding at the beginning of the course. Credit for this does not lie solely with this EE course, since, as an INSET provider, Carol had been involved in the Curriculum 2005 Advocacy campaign and the Continuous Assessment pilot schools project as a trainer, and had therefore needed to have a clear understanding of the concepts involved.

## CHAPTER 5

### PRESENTATION OF OUR FINDINGS

#### 5.1 INTRODUCTION

It seemed to me that the most appropriate way of presenting what I had learned from my respondents was to write a story of each person's journey through the EE course, as I perceived it. The stories are based on my interpretation of the questionnaires and follow-up interviews, my research journal and the concept maps, together with my interpretation of what each person wrote about themselves in their journal and said in their narrative. The stories begin with the person's construction of what they were like when they joined the course and continues with their particular journey as they deconstructed and reconstructed reality about EE and OBE and the philosophy and learning theories on which these are founded. Each person was given the story to read, comment on, add to and change as they chose. The stories were then rewritten and presented to the respondents for final acceptance, and for this reason, I present them as **our** stories.

#### 5.2 OUR STORIES:

##### 5.2.1. PHUMLA (January 1997)

This story is based on only one workshop and two questionnaires as Phumla left the course. I chose to include her contribution out of respect for what she taught me in the short time we worked together. I continued to see Phumla, and chat to her, and she agreed to allow me to include her story.

##### 5.2.1.1 WHERE WE STARTED

Phumla is a Primary school teacher, teaching at a small rural school, close to a nature reserve and a rapidly growing informal settlement. She has been teaching for twelve years, and is presently teaching Grades 5 and 6 together in one small classroom.<sup>1</sup> The school has an Enviro Club, under the wing of the Wildlife and Environment Society, and so environmental education is not a new concept for her. I do not know Phumla's early life experiences, which may have contributed to her understanding of environmental education, as the narratives were recorded after Phumla left the course.

<sup>1</sup> This means that she has to teach all subjects to two classes, a common practice in rural schools.

Before attending the first workshop, Phumla was involved at school in EE through Arbor Day, Water Awareness Week and World Environment Day.<sup>2</sup> She had used the local environment for teaching her Grade 5 and 6 learners in the past, by taking them for walks in the nearby nature reserve, under the leadership of Nature Conservation Officers. Her understanding of “the environment” at this stage was quite sophisticated. It was important, she felt, for children to become aware of the beauty of God’s creation, and to develop a love and concern for the environment, so that it could be conserved and used for sustainable living by future generations.<sup>3</sup> She was sensitive to the need to recycle, not only from an aesthetic point of view, but also from an economic point of view, and so she was involved in her school and in her community.<sup>4</sup>

<sup>2</sup>Pre-ques: 5 Her involvement was not active, as competitions were organised by the Wildlife and Environment Society, and the activities organised by another teacher, however, she felt it was important to commemorate such days in order to show their importance, “for neatness sake, as well as the economy” (Pre-course quest.)

<sup>3</sup> Pre-quest: 8. This is what Ballantyne and Bain would label “eco-centric” (Winter & Reddy, 1996)

Phumla decided to embark on the EE course in order to enhance her love and concern for nature, to motivate her in her teaching and to upgrade her qualifications.<sup>5</sup> She was aware that she had, at this stage, a “poor” understanding of the teaching and assessing strategies required for OBE<sup>6</sup> and hoped to become more aware of these as a result of the course. At the same time she hoped to gain knowledge and skills which would help her play a more meaningful role at all levels of society, and learn how to cope with environmental issues.<sup>7</sup> She was aware that the course would involve a commitment of time to a number of workshops which would include field trips and practical work<sup>8</sup>. And so she attended the first workshop.

<sup>4</sup> Pre-ques:4

<sup>5</sup> Pre- quest: 7

<sup>6</sup> Pre- quest: 6

<sup>7</sup> Pre- quest: 10 (b): interview

<sup>8</sup> Pre- quest: 9

### 5.2.1.2 THE JOURNEY

The aim of the first workshop was to “open windows” onto the local biophysical environment, serious environmental issues facing the world and constructivist teaching methods.<sup>9</sup>

Phumla thoroughly enjoyed the trail through the Nature Reserve where she stated that she had “gained knowledge”. She learnt to identify animal droppings and to listen to and identify, bird and insect sounds. She was struck by the variety of leaf shapes and textures, something she had not really been aware of until she had to look for and collect as many different kinds as she could. She

<sup>9</sup> Orr (1992:147) claims that for change to begin a person needs to develop an “I care attitude”. This was a way of doing this whilst demonstrating constructivist teaching methods.

learnt about the healing properties of some of the herbs, particularly of leaves used in cultural rites. She learnt about the unique mutualistic relationship of alga and fungus in lichens. She worked in a group to create a food web collage from the collections of items of particular interest made on the journey. All these made an impression on her.<sup>10</sup>

<sup>10</sup> Quest 2: 1, 6

A number of simulation games were played, and the game which impressed her most was the shopping game, which she says made her aware of the need to budget wisely and to try to improve the quality of life of our people.<sup>11</sup>

<sup>11</sup> Quest 2: 4

As a result of her experience at the workshop, Phumla decided to try some of the activities with her learners. She took them on a Blindfold Walk, to develop their senses other than sight; she took them on a trail of discovery in the forest, followed by the making of a food-web collage, and she played the Shopping Game. She also tried group work with her learners. She began recycling paper into *papier-mâché* to make articles such as ashtrays for sale, and cutting plastic bags into strips to crochet into hats and bags.<sup>12</sup>

<sup>12</sup> Quest 2: 2, 9

Phumla expressed a desire to learn more about group teaching/learning techniques, to develop skills to help her identify and solve environmental problems, for more experiences to help develop attitudes and values for the environment so that she would be motivated to become actively involved in environmental protection.<sup>13</sup>

<sup>13</sup> Quest 2: 8

By the end of Workshop One, Phumla felt that she had a better understanding of “values”, “attitudes” and “skills”, and what “continuous assessment” meant. She felt that her understanding of how to organise group work with learners, constructivism, and the use of journals and portfolios was “good”.<sup>14</sup> This is borne out in her first concept map which shows that she saw EE as the way to achieve justice and peace in society by negotiation. The map shows that Phumla, at this stage, has not clearly understood the holistic nature of the environment, seeing the environment as part of EE, but unlinked to the biophysical, political and economic environments.<sup>15</sup>

<sup>14</sup> Quest 2: 10

<sup>15</sup> Fig 2 p 45

Phumla was prepared to put in at least two hours a day on her studies for this certificate course.<sup>16</sup> Unfortunately, she found that this course, together with other courses she was doing, required more time than she could spare from teaching and home commitments, and when she was forced to miss the valuable experiences of the second workshop, she realised she had to make a choice, and so chose to drop out of this course for 1997 and pick it up again in 1998, when she would have more time to devote to her studies.<sup>17</sup> This did not mean that she lost interest. She was kept informed by the other two teachers from her school, who were on the course, and continued to practice the EE strategies she had learned, in her classroom.<sup>18</sup>

<sup>16</sup> Quest 2:7

<sup>17</sup> This is a common problem as under qualified teachers seek to upgrade their qualifications as quickly as possible. Many embark on a number of courses, not realising how demanding they will be, especially if they involve weekend workshops and assignments.

I found it interesting that of all the teachers, Phumla seemed the most environmentally aware, and the most environmentally active, yet April, the Wildlife Education Officer, did not know her.<sup>19</sup>

<sup>18</sup> Pers. Comm.

<sup>19</sup> April Narr:241-254

## 5.2.2 ZIBI'S STORY (January to August 1997)

### 5.2.2.1 PERSONAL BACKGROUND

Zibi came into the teaching profession 25 years ago because when she was young, her parents were not wealthy and teacher training was one way of getting a higher education. She had not enjoyed school because she "did not know arithmetic", and so got into trouble from a "very strict and strong teacher"<sup>1</sup>. Her mother often had to "drag" her to school. She did not want to be a teacher. She says, "I'm a made-up teacher", but for all that, has always given of her best. Her strength lies on administration and organisation which means that she enjoys her present position as Principal of a small rural Primary school on the outskirts of a city, bordering on a nature reserve and close to a rapidly growing informal settlement.<sup>2</sup>

<sup>1</sup> Narr: 6

<sup>2</sup> There were only four teachers in the school. There were only two classrooms in the school grounds, the other two being housed in the village close by. The children had a patch of garden which they tended as part of the Enviro Club. The school was situated on the edge of a natural forest, which meant that the children did not have to travel to do forest studies. Another advantage was that the teachers all lived very near the school, and were part of the community.

<sup>3</sup> Narr: 81

Zibi grew up on the outskirts of Butterworth, in an area devoid of trees - as she puts it: " There were no bushes.... The dry veldt. ...We didn't have even wood. What we used was the dry cow dung to use as fire wood."<sup>3</sup>. She therefore understands why people use whatever is available in the environment,

for survival purposes, and do not consider the long term effects. However, she was brought up to keep her local community clear of litter<sup>4</sup> and this teaching has stayed with her. She believes that learning about and caring for the environment is an important aspect of what she calls “quality education”<sup>5</sup>, and so she was happy to have an Enviro Club in her school, and to take part in activities planned for Arbor Day, Water Awareness Week and World Environment Day, as well as take part in anti-litter campaigns<sup>6</sup>.

<sup>4</sup> Narr: 96, 116

<sup>5</sup> Pre-ques: 4, 5

<sup>6</sup> Pre-ques: 3, 4

Being close to a nature reserve, with access to Nature Conservation Officers meant that Zibi used the local environment in teaching her Grade 3 and 4 learners<sup>7</sup>, but because as she puts it “I was just an ordinary human being who didn’t know anything about environment and how to conserve it...”<sup>8</sup>, she relied heavily on the Nature Conservation Officers. The nursery, which had been erected in the school grounds to grow seedlings for the community, and the learners’ trench gardens were vandalised, and she did not have the necessary knowledge to get it going again.<sup>9</sup>

<sup>7</sup> Pre-ques: 5

<sup>8</sup> Narr 25

<sup>9</sup> Narr: 214 -226

#### 5.2.2.2 WHERE WE STARTED

Zibi joined the EE course to help her prepare for the changing education system and to help her to teach more effectively.<sup>10</sup> She felt that her understanding of the of the teaching and assessing strategies required for OBE were “poor”, and hoped the course would help her improve her own education and solve any problems she came across at work.<sup>11</sup> She understood that it would mean, as she put it, “Too much extra work!”<sup>12</sup>

<sup>10</sup> Pre-ques:7

<sup>11</sup> Pre-ques: 6, 10

<sup>12</sup> Pre-ques: 9

#### 5.2.2.3 THE JOURNEY:

The setting of the first workshop was a surprise. In spite of having grown up and of working in a rural setting, she was not happy and felt “out of place”, because there was no tuck shop, she did not know anyone (although she had come with a teacher from her school) and she felt disorientated by the surrounding bush.<sup>13</sup> Furthermore, the warnings about rhinos and electrified fences added to her desire to leave at once!

<sup>13</sup> Journ: 30-46

The arrival of friends from Transkei, and the pleasantness of the tutors began to put her at ease, but she still felt very lost,<sup>14</sup> because she had not really known what the course was about. Once the activities started however, Zibi lost her nervousness and began to understand what was happening. She enjoyed the field activities very much, feeling that she was learning “about the qualities of life”.<sup>15</sup> Videos about the environmental crisis facing the world were shown,<sup>16</sup> but none made as big an impact as the slide-talk on amphibians and reptiles,<sup>17</sup> mainly because the lecturer brought along a live Burmese python. She claimed that had she known about this in advance, she would not have come! She says, however, “The snake is about 40 years old. Some of my colleagues were frightened. I was not scared because the guest speaker had first informed us about the snake and its size”.<sup>18</sup> She claims, too, that she learnt something “in disguise that to teach the environmental education to the pupils is my duty and not to be scared of animals like snakes, if I want my lessons to be successful”.<sup>19</sup>

<sup>14</sup> Journ: 47-52

<sup>15</sup> Quest 2: 1

<sup>16</sup> Zibi stated in an informal conversation that she had found the commentary on the videos difficult to follow.

<sup>17</sup> Quest 2: 3

<sup>18</sup> Journ: 69

<sup>19</sup> Journ: 78-81

A number of simulation games were played, each giving a different insight into an aspect of EE. Zibi noted: “In every lecture or lesson, we had to participate, discovered things and skills were sharpened”<sup>20</sup> This participation gave her the confidence to try some of the activities when she got back to school, and she subsequently tried the Blindfold walk, and the Opening Windows walk. She also tried using group work with her learners in class.<sup>21</sup>

<sup>20</sup> Journ: 88  
Ques 2: 6

<sup>21</sup> Quest 2: 2, 9

Zibi had noted that her school had bins for recycling tins, paper and glass, but that when one of them had been stolen, the others were put away for safety. This did not mean that the recycling stopped. The articles were placed in plastic bags instead, and the paper was used in the trench gardens.<sup>22</sup>

<sup>22</sup> Narr: 193 - 204

Finding time to study was difficult for Zibi. She had planned to spend two hours a day,<sup>23</sup> but this was impossible on some days. She said:

<sup>23</sup> Ques2:7

*As a working mother, I don't always have enough time to study. When I come from work I have to prepare supper for my family and after that I have to prepare lessons for the following school - lessons at school, but I always have two hours before I go to bed to look at my Core Text and my*

*readings. But sometimes I feel so tired that I don't even have time to open the book.* <sup>24</sup>

<sup>24</sup> Narr: 25-29

She also found keeping a reflective journal difficult as she was unsure of exactly what was entailed. She tended to keep a diary. This sense of inadequacy was reflected in her assignments and added to her feeling of insecurity. "When someone talks about assignment, I feel like crying".<sup>25</sup>

<sup>25</sup> Narr: 34

Zibi's first concept map was incomplete as it had few linking lines and no explanations for the links.<sup>26</sup> However, the layout of the concepts supports her claim that she had gained a more holistic understanding of the environment.<sup>27</sup>

<sup>26</sup> Fig 1 p 44  
(I comment on this in Chapter 6, taking responsibility for not explaining the process properly)

Furthermore, there was some understanding, firstly that EE was the way by which society gained knowledge via the individual, and secondly that the environment can be used to develop attitudes, skills and values needed to negotiate (understanding?). This supported her claim to now have a "good" understanding of "values", "attitudes" and "group work", and a "moderate" understanding of "skills", "journals" and "portfolios".<sup>28</sup>

<sup>27</sup> Narr: 18

<sup>28</sup> Ques 2: 10

#### 5.2.2.4 BETWEEN WORKSHOPS:

Several readings were given which needed to be critically read and reflected on in the journal. These readings would also give the student useful information for the first assignment. Zibi found the language of the papers difficult. As she said, "Readings are not easy to understand, but if you keep on reading you do have understanding".<sup>29</sup> She did not write in her journal at all, thinking that the journal was to be used only while at a workshop. She felt discouraged by the negative criticism of her journal "...you'll use your full force thinking you're writing the correct thing. Oh, shame! the tutor will tell you that your journal is really a diary."<sup>30</sup>

<sup>29</sup> Narr: 29

<sup>30</sup> Narr: 30-32

#### 5.2.2.5 WORKSHOP TWO:

As a result of the second workshop, which was mainly theoretical and historical, Zibi understood that learning occurs through experience, but had not yet linked this to social construction of knowledge. She understood why she had been taught the way she had at school (the transmission method of

behaviourism) and noted that the course itself demonstrated that the teacher is now to be seen as a facilitator, and sometimes a co-learner and sometimes a transmitter. She was by now trying to teach differently because she believed that behaviour change could not be imposed on people - they would learn by the setting of a good example and by working with them and not on them.<sup>31</sup>

<sup>31</sup> Ques 3: 1, 2, 3  
This response answers my question as to whether this particular teacher would find it easy to make the called for paradigm shift.

Zibi had grown in terms of her understanding of EE, seeing it now as a way in which people could work together in such a way that it allowed them to express their own opinions, perceptions and values - in a social context.<sup>32</sup> However there is no clear understanding of whether this led to the construction of new knowledge.

<sup>32</sup> Ques 3: 4

During workshop 2, further teaching strategies were demonstrated, viz. using video clips of environmental issues, and coloured pictures to generate discussion. Zibi found this very effective and came to understand "that the aim of EE is to create sustainable environments in which people live and work".<sup>33</sup>

<sup>33</sup> Jour: 125

Having had outcomes-based teaching strategies demonstrated, papers on continuous assessment (CA) were introduced during workshop Two. From claiming to have "poor" understanding of continuous assessment before the course started, Zibi now (in March) understood that the value of CA is to allow the teacher "to use any planned learning experience to assess each learner's achievement and progress", and that "The learner and learning should be the main focus of all classroom activities, including testing and evaluating".<sup>34</sup>

<sup>34</sup> Ques 3: 5

After only two workshops, Zibi was aware that she had changed to the extent that "we now use a variety of assessment and evaluation strategies that are based on criterion referencing". She puts this change down to learning about OBE which as she notes, "focuses not only on what you learn, but on how you learn."<sup>35</sup> In other words, the process of learning becomes just as important as what you learn . She said, in her narrative:

<sup>35</sup> Ques 3: 6

*...through the Core Texts and the reading I have, I am wide open and I have changed, in that I know much about the environment and its creatures. The trails, the lessons have*

*changed me and I have also changed my old teaching methods. And the learners I am teaching are also gradually changing to the love of the environment. They enjoy the lessons most when we leave the classroom and go out to the forest and bushes and listen to the different sounds of birds, and searching for the stools of animals and to differentiate if the animal is a herbivore, or a carnivore or an omnivore.*<sup>36</sup>

<sup>36</sup> Narr: 17-23  
Hungerford & Volk (1990:11), Etchberger & Shaw (1992) and Orr (1992: 147) found that experience was important to promote intellectual and personal growth.

Further on she says:

*Coming to OBE - the course has helped me to understand the shift in education. Now I have changed the putting of desks in rows and I am no more the know-all person. I and the learners work co-operatively, and through OBE I understand that learners learn more when they participate in lessons and they do not forget what they have done. I also like the assessment method because not every learner can learn, but can DO things. And what I like most is that you cover many learning areas and the critical outcomes in one lesson - learning area. (programme).*<sup>37</sup>

<sup>37</sup> Narr: 37-42

#### 5.2.2.6 FURTHER WORKSHOPS:

Workshop 3 focused on trails as a means to construct knowledge. A rocky shore, a sandy shore and an urban trail were demonstrated and backed up by information on OBE. Again, by actually doing the trails and experiencing first hand the wealth of information about real issues which can be generated, along with the development of skills, values and attitudes, not forgetting the fun, Zibi was able to write in her journal: "It helped us to identify and also solve some problems and we were able to ask the right questions. The value of real issues was also installed".<sup>38</sup>

<sup>38</sup> Journ: 220 -223

By July, and Workshop 4, Zibi felt that she had learnt a lot about EE, but that there was still more to learn.<sup>39</sup> This is borne out to a certain extent in her second concept map, where she writes, "You learn about the environment through EE".<sup>40</sup> She did not feel confident about debating on EE, but confident about demonstrating EE methodologies in her Phase at school. Because of this she also felt confident about Curriculum 2005 the new OBE curriculum (having also attended the Curriculum 2005 Advocacy Workshops, as well as gaining information from this course).<sup>41</sup> She felt she still needed help from

<sup>39</sup> Ques 4: 5.2

<sup>40</sup> Fig 5 p 49

<sup>41</sup> Ques 4: 5.3 - 5.7

Subject Advisors, INSET providers and EDO's in order to improve her teaching in a learner-centred classroom.<sup>42</sup> This is supported by evidence from her second concept map which although it shows a clearer understanding of the relationship between portfolios, outcomes, constructivism (linked to skills, values and attitudes) and continuous assessment, shows in the arrangement of the concepts, that there is still some confusion.<sup>43</sup>

<sup>42</sup> Narr: 43-45

<sup>43</sup> Fig 5 p 49

### 5.2.2.7 MY REFLECTIONS

I gained valuable insights from Zibi for my work as an INSET provider. It seems that it is necessary to hold a number of developmental workshops, and that it is important to let teachers "grow" between them. It is useful to supply readings to inform them of the theory behind their learning, but that these need to be simplified for a number of reasons: Most of the teachers I work with speak and read English as a second language; teachers usually attend to studies at night when they may be tired, and find it difficult to concentrate, and many teachers are not used to academic language. An interactive text, which requires the reader to "Stop and reflect" is also advised. It seems too, that to help teachers discipline themselves to do the readings, assignments are essential, but that if these were focused in the classroom, requiring teachers to do something with their learners, it would make the assignment easier to complete, and more relevant to the teacher.

### 5.2.3 SIBONGILE'S STORY ((January to August 1997)

#### 5.2.3.1 PERSONAL BACKGROUND:

Sibongile grew up in Potsdam, a semi-rural area on the banks of the Buffalo River, close to Mdantsane. The area was wooded, and so she played and worked in a natural environment. Her parents, especially her mother, was strict about not littering and not harming wildlife. This was drilled into her from an early age, and throughout her Primary schooling, and although at Secondary school and at Teacher Training College, there was no emphasis on keeping the environment clean, Sibongile remained conscious of her early upbringing, and experience of the natural environment.<sup>1</sup>

<sup>1</sup> Narr: 1 - 27

After attending Teachers' College, at which she was trained in Fundamental Pedagogics and Behaviourism, and obtaining her Senior Primary Teaching Diploma, Sibongile came, in 1993, to teach Grade 7 (teaching all subjects) at a

small rural school close to a Nature Reserve and a rapidly growing informal settlement. This school had an Enviro Club, and Sibongile as the youngest of the four teachers, was given the Club as her extra-mural activity.<sup>2</sup> The school children grew vegetables by the trench garden method, and took part in the various competitions organised by the Wildlife Society for the Enviro Clubs. Another aspect of the club was the collection and recycling of paper, glass and tins. For this the school had been provided with three large drums, which were placed in the school grounds. Unfortunately, one was stolen, and so the other two were placed in a storeroom for safety.<sup>3</sup> The residents of the nearby informal settlement are poor, and always on the lookout for building materials, and the school suffered from periodic vandalism which limited the activities of the school.<sup>4</sup>

<sup>2</sup> Narr: 35,  
Pre-ques: 5

<sup>3</sup> Narr: 50 - 53

<sup>4</sup> Narr: 54 - 58

The school regularly took part in Arbor Day, Water Awareness Week, and National Environment Day activities organised by the Wildlife and Environment Education Officer through the Enviro Club,<sup>5</sup> but Sibongile did not, at that stage link EE to her classroom teaching. It was through the Wildlife Society Officer that she first heard about the Gold Fields EE Diploma Course,<sup>6</sup> and because she liked what she was learning through the Enviro Club, she decided to apply, although she admits that she did not know what she was letting herself in for!<sup>7</sup> She saw the EE course as a way of improving her knowledge of the environment, while upgrading her qualifications in preparation for the coming changes in education.<sup>8</sup>

<sup>5</sup> Pre-ques: 3,  
Narr: 29 - 33  
Were it not for the  
WLS Education  
Officer, little would  
have been organised.

<sup>6</sup> Narr: 61 - 63

<sup>7</sup> Jour: 23

<sup>8</sup> Pre-ques: 7, 10,  
Pers. comm.

### 5.2.3.2 WHERE WE STARTED:

Sibongile came to the first workshop as a Grade 7 (Std 5) teacher, with a positive attitude to caring for the environment,<sup>9</sup> but with little understanding of the holistic nature of the environment, and less of Environmental Education,<sup>10</sup> Outcomes-based teaching and learning strategies, and Continuous Assessment.<sup>11</sup> She felt that she needed to know more, and that Environmental Education held the answer. She writes in her journal:

<sup>9</sup> Narr: 7 - 9

<sup>10</sup> Pre-ques: 8, Narr:  
70-80

<sup>11</sup> Pre-ques: 6

*Through this course my wish and my hope is to get the necessary information that I can use for the future and to generations to come.*<sup>12</sup>

<sup>12</sup> Jour: 26-29  
This quote also shows that she expects to be filled - the familiar transmission method

### 5.2.3.3 THE JOURNEY:

The first workshop was held in Thomas Baines Nature Reserve outside Grahamstown. Sibongile was pleased about being in “in the bush” at first, but after a while found it too quiet!<sup>13</sup> She felt a little out of her depth when she met the other students and found that a lot of them held higher degrees, and worked in Colleges of Education, and at INSET Centres, but was put at ease by being told that the course was a participatory one and everyone was expected to contribute.<sup>14</sup>

<sup>13</sup> Jour: 10

<sup>14</sup> Jour: 18-20, 33-36  
Narr: 107 - 117

The first workshop was designed to “Open Windows” and Sibongile thoroughly enjoyed the activities. Apart from these, it was a new experience to be allowed - and indeed, expected - to share her understanding, and that made her feel better.<sup>15</sup> The outdoor activities which she commented on included a Blindfold Trail to stimulate senses other than sight, and a trail through the reserve, stopping now and then to listen to sounds, draw objects near and far, collect leaves of different shapes and textures, identify spoor and droppings, and learn about the Valley Bushveld vegetation.<sup>16</sup> Back at the EE centre, videos on global environmental problems were shown, and these made her aware of how the “... human species is selfish, it does not care about other living things ... as a result they become extinct and aquatic life is at risk because of Man”.<sup>17</sup> She noted too, that we can change everything, it seems, except ourselves. The videos, apart from extending her knowledge base, began her thinking that “we must reduce population growth, reduce the death toll so as to save the world”. This view is repeated when she writes in her journal the “People should be educated about different plants and animals so that they do not destroy them. Children should be educated to respect ocean and not pollute it”.<sup>18</sup>

<sup>15</sup> Jour: 29

<sup>16</sup> Ques 2: 1, Jour: 55 - 65

<sup>17</sup> Journ:135-139 It seems that viewing a video can have an effect on one’s attitude, and can be used to promote an “I care” attitude (Orr, 1992).

<sup>18</sup> Jour: 48.  
Jour: 186 -187  
This, according to Winter and Reddy (1996) is a “guardianship” stance, which is considered to be relatively unsophisticated.

A number of different simulation games were played which each gave insight into a concept of EE and these gave Sibongile ideas for using in her classroom. She said that by actually taking part in the game herself, she understood more

about the concept it was demonstrating, and this gave her the confidence to try the games with her learners.<sup>19</sup> The Shopping game, which demonstrated very graphically how selfish people are and how we want the best for ourselves, even if it means those less fortunate than ourselves get even less, made an impression on Sibongile, and she felt that the aim of the game was to teach us to note the uneven distribution of wealth, and how greedy we are.<sup>20</sup>

<sup>19</sup> Ques 2: 6

<sup>20</sup> Jour: 76-95

The Woolly Web game gave Sibongile a very graphic illustration of how everything is interconnected in life, and how an imbalance, or damage to one aspect, has an effect on many others, and that to put one thing right requires untangling the whole web. She writes: "I can explain this game by saying nothing can stand on its own. In the environment everything depends on the other for survival. This is the reality of life".<sup>21</sup>

<sup>21</sup> Jour: 186 She has, this early on, gained an insight into the holistic nature of the environment.

The practical, participatory design of the workshop, where Sibongile worked with others to design an activity for her Higher Primary class, had the effect of giving her something she really wanted to try once she got back to school. She subsequently used the Woolly Web game and tried grouping her learners so they could work as a team.<sup>22</sup>

<sup>22</sup> Ques 2: 9 Having a chance to try out an activity in "a learning community", as Prawat (1996) put it, does help teachers move towards constructivist teaching, but as he points out, a teacher needs long term, ongoing support.

The format of the workshop was so different from what she was used to with transmission teaching, that she felt an undercurrent of insecurity, by not knowing what was expected.<sup>23</sup> However, she began to appreciate that knowledge is socially constructed. She states in her journal:

<sup>23</sup> Jour: 97

*When the topic (the shopping game) is discussed locally (applied to communities) it is discovered that people are not equal and have different priorities.<sup>24</sup>*

<sup>24</sup> Journ: 93

As the workshop progressed and more activities were done, she felt more confident, enjoying the water study, learning about water animals, and finding that participatory learning is fun, and that group work develops skills and values. She says:

*I have discovered that working together in a group is fun too, one learns tolerance, to accept each other's ideas, to*

*communicate and discuss problems and come to an agreement.*<sup>25</sup>

<sup>25</sup>Journ: 116-119  
Narr: 248 - 252

A further valuable learning experience came from an illustrated talk on amphibians and reptiles, and the opportunity to see and handle a live Burmese python. This changed her attitude to snakes from fear, to wariness as she did not know that there are harmless snakes. She says: "The very experience that I have for a lifetime is to touch a snake alive and not injected [bitten]".<sup>26</sup>

<sup>26</sup>Journ: 124

As a result of the theory and practice gained on Workshop One, Sibongile felt she understood the concepts of outcomes, values, attitudes, group work, journals and portfolios better, and had a good understanding of skills, but wanted to learn more.<sup>27</sup> Her first concept map<sup>28</sup> reflected the growth in understanding of the holistic nature of the environment and the importance of developing knowledge, skills, values and attitudes in order to help people respond to environmental issues.

<sup>27</sup>Ques 2:8

<sup>28</sup>Fig 3, p 46

#### 5.2.3.4 BETWEEN WORKSHOPS:

A few readings were given to students, some of which were quite heavy for teachers who were returning to academic study after some years.<sup>29</sup> These, together with the Core Texts on Education Theory and Environmental Education were to be used to inform the assignment and to develop critical thinking. Sibongile now understood why she had been taught by the transmission method, and saw that in fact, knowledge is gained by using our senses and constructing knowledge for ourselves, which we then socially reconstruct into a more socially accepted understanding of "truth".<sup>30</sup>

<sup>29</sup>Ques 2:7 She reported that she read and wrote in her journal every afternoon, but this is not borne out in her journal

<sup>30</sup>Ques 3: 1, 2 Sibongile found some of the reading "difficult" because she was unused to the academic language.

As a result of a workshop arranged by her Principal, Sibongile gained specific ideas from an INSET provider for English Second Language. She was given some games to play, teaching posters and reading material, but she did not use them at this time. She linked these ideas to her new knowledge, and tried group work with great success.<sup>31</sup> However, she did not use group activities all the time as she did not have time to write new lesson plans for every lesson.<sup>32</sup>

<sup>31</sup> Etchberger & Shaw (1992) and Prawat (1996: 412) shows that this is a stage, or phase that a teacher in transition undergoes.

### 5.2.3.5 FURTHER WORKSHOPS:

Having been allowed to actively participate in various activities herself, helped Sibongile to feel more confident about trying new ideas, and the theoretical understanding helped to explain the need for change. The learning theories helped her understand her learners, and the need for continuous assessment as part of the process, began to clarify. She said in her narrative:

*I am sure that by learning constructivism we can be able to detect even a problem to your pupils because now you will understand them. That is what I have found.*<sup>33</sup>

<sup>33</sup> Narr: 258-260

The learners so enjoyed the group work that they asked for more of it and this encouraged her to use the strategy more often.<sup>34</sup>

<sup>34</sup> Narr: 220-228 Ques 3: 4

Within two months, and after two workshops, Sibongile felt that she had changed quite a lot. Her knowledge of educational theory and environmental education had increased, and she had already tried implementing constructivist teaching strategies,<sup>35</sup> but because of the lack of information from the Education Department on the new curriculum, she was feeling concerned about her ability to cope. In spite of this, she was willing to give it a try, as she writes:

*I can see that there is a new curriculum that is being introduced but my worry is will it be able to proceed at our schools for there are still problems. For instance in my school there is no subject teaching. I do all the work myself. As I have read and heard in sessions that there must be team working in teachers how if other teachers do not want to change. The work can be easier as I teach alone because I'll get to know the learners more and their weaknesses but thorough preparation can be tough, anyway I'll see how it goes.*<sup>36</sup>

<sup>35</sup> Ques 3: 6 This supports what Orr (1992:147) found - that environmental experience is critical and must reinforce intellectual and personal growth.

<sup>36</sup> Journ:341-351

By the end of Workshop Two, Sibongile had a clearer understanding of what is meant by the environment and the issues facing the world. The videos made an impact, providing new knowledge and understanding. Her confidence had grown as she learned more about constructivism, and teachers and learners as co-learners,<sup>37</sup> so that when she attended her first OBE workshop in April, she realised that she did not have to fear the new curriculum, as she would learn alongside her learners. This encouraged her to try some of the games that she had been given in February, with startling results. She said:

<sup>37</sup> This supports the findings of Ballantyne and Packer (1996:25)

*I tried four of those games... and put them into groups, they sat in groups and I gave each different games, each group different games, and I was so amazed that the children can do, because we always, I think we always judge the children, their capabilities. But I am sure we misjudge them. Because, what they did... the others had to write words, and the words that came out of them! I couldn't believe.... they even used the science words that they heard of, the geography.... all the words they have heard... Oh! I couldn't believe.... and going to the other group and they enjoyed it, they enjoyed it !<sup>38</sup>*

<sup>38</sup> Narr: 85 - 92

From then on she used a different approach in her teaching. Instead of simply transmitting knowledge in science she says:

*I used to tell them "You get this on a fish and you get that on a fish" and now I am trying to change my approach now so giving them a chance to tell me what they know. And sometimes they tell you something you didn't expect from them and you just think about it because you had in mind that they'll tell you this and then they come out and tell you something different from that. Even things that you didn't notice, the minor things.<sup>39</sup>*

<sup>39</sup> Narr: 173-178

By the fourth workshop, in July, Sibongile felt confident about what was meant by EE and a lot more confident about OBE, but still felt uncertain about teaching in an OBE style<sup>40</sup>- this because at this stage (July) she had no clear understanding of just how big a change is expected in teaching with Learning Programmes rather than subject syllabuses. OBE was to have been introduced in Grade 7 in 1998, but this had subsequently been dropped, and so she has more time to grasp just how big a change it will be. This uncertainty is borne out in her second concept map <sup>41</sup> which, while illustrating a much clearer understanding of most of the concepts, still shows no link between continuous assessment and fieldwork, journals and portfolios. The map shows that whilst Sibongile knew that constructivism had something to do with the environment, she was unsure of what the word meant. She stated in her narrative that she had "just guessed". <sup>42</sup> Yet elsewhere she had said that constructivism could help her detect learner's problems.<sup>43</sup>

<sup>40</sup> Ques 4: 5.2, 5.4, 5.6

<sup>41</sup> Fig 6 p 50

<sup>42</sup> Narr: 209

<sup>43</sup> Narr: 258 -260

### 5.2.3.6 MY REFLECTIONS:

When I consider what Sibongile has said after four workshops, and apply it tentatively to INSET design, it seems that workshops should involve as much active participation as possible, supported by visual information as well as Core Texts, which should be in simple, easy to read language. A journal in which to explore new ideas and experiences seems to help. Of greatest importance is the opportunity to try the activities with a group of colleagues and reflect on them before attempting them in class. Sibongile felt that being given assignments to do consolidated knowledge and encouraged disciplined reading, but that more guidance should be given on writing assignments and keeping a reflective journal. She intimates that ongoing support from Subject Advisors and INSET providers is essential to help the teacher gain confidence and develop her own teaching material.

### 5.2.4 CAROL'S STORY (January - July 1997)

#### 5.2.4.1 PERSONAL BACKGROUND

Carol grew up as a daughter of a clergyman. This meant that she lived in many different places, some, mission stations in a rural setting, others major towns. Living in the countryside made her aware of the beauty of nature, and living on a clergyman's stipend meant living lightly on the land. She recalls with pleasure the family trips to stay with friends and relatives, or in clergy cottages, in some of the most scenically beautiful parts of South Africa.<sup>1</sup> She says, of her schooling :

<sup>1</sup> Narr: 1 - 14

*And then in Primary school.... I can't really remember much... We didn't... We did projects and things, but they were never really **for** the environment, not even as much as my own children have done. It wasn't very much... It was Nature Study.<sup>2</sup>*

<sup>2</sup> Narr: 15-17

High school biology, while somewhat practical, was taught by a Domestic Science teacher, and it was only at university that Carol's love of the environment blossomed. She says:

*...from doing a B.Sc. and going on as many field trips as I could and being a member of the Mountain Club and going hiking was when I really got to be environmentally aware.<sup>3</sup>*

<sup>3</sup> Narr: 24-26

From this time, she says, she was called a “greeny” because she was interested in every little creature she spotted.<sup>4</sup> Another growth point in her life was a year spent as an exchange student in America. She says:

<sup>4</sup> Narr: 53 - 58

*...living in the Greater Los Angeles with all the pollution, I came back to this country and sort of suddenly started seeing how clear the air was in comparison. The school I was at there was sort of lower middle class, a lot of poor kids, and a lot of rubbish lying around, so I’ve always hated litter.*<sup>5</sup>

<sup>5</sup> Narr: 60-63

Once she became a teacher, she made the most of the outdoors, teaching Biology at M- and A-Level in Zimbabwe. As she puts it: “We had a ball!”<sup>6</sup>

<sup>6</sup> Narr: 46 - 52

#### 5.2.4.2 WHERE WE STARTED:

Carol has now been teaching for sixteen years, firstly in schools and latterly at an In-service Centre for teachers. As there were no permanent students, the Centre did not observe environmental days such as Arbor Day, Water Awareness Week or World Environment Day.<sup>7</sup> However, Carol herself, has been recycling paper, glass, plastic and aluminium for some time.<sup>8</sup> She had often used thematic teaching at school, and in INSET had introduced an environmental aspect into the courses she organised for senior school Biology teachers, emphasising the value of the local environment as a teaching resource.<sup>9</sup>

<sup>7</sup> She felt that since she was not working with children, it was not necessary to observe these days.

<sup>8</sup> Pre-ques: 3, 4

<sup>9</sup> Pre-ques: 5

When she joined the EE course, Carol felt that because of her own teaching experience, and her work on curriculum development, her understanding of terms such as “outcomes”, “values”, “attitudes” and “skills”, was good. Her understanding of group learning techniques and continuous assessment she rated moderate, whilst her understanding of constructivism and the use of journals and portfolios in teaching and assessment, she considered poor.<sup>10</sup> At this time Carol understood environmental education as a teaching method, and not a subject on its own.<sup>11</sup>

<sup>10</sup> Pre-ques: 6

<sup>11</sup> Pre-ques: 8

Carol joined the course because she wanted to learn about the new teaching methods associated with OBE, and as a refresher course for herself - to pass

on to teachers. At the same time she hoped to gain clarity on OBE, EE and the link between them, whilst “stimulating her brain”. She hoped, too, that by joining the course, she would become more tolerant, flexible and able to cope with 5-day workshops which she hoped to hold in the outdoors.<sup>12</sup> This expectation has not been fully met. She said that by the fourth workshop she felt that she had actually become less tolerant!<sup>13</sup>

<sup>12</sup>Pre-ques: 7, 10

<sup>13</sup> Narr: 255- 258

At the start of the course, Carol felt that the course would not be as demanding as a B.Ed.<sup>14</sup> She changed her mind, saying later: “Studying for this course has been more difficult than any studying I’ve done to date!” She put this down to an extremely hectic working day, and a demanding teenage family.<sup>15</sup>

<sup>14</sup>Pre-ques: 9

<sup>15</sup> Narr: 83

#### 5.2.4.3 THE JOURNEY:

The first workshop was designed to “Open Windows” onto the environment, and therefore incorporated many activities involving the outdoors. The day began with a Blindfold walk, and then a leisurely walk through a part of the reserve, stopping to listen to sounds, draw objects using a toilet roll tube with string cross wires to help get proportions right, collecting leaves of different shapes and textures on a “palette”, and finally, ten items of personal interest. Carol wrote, after doing the Blindfold Walk:

*Amazing how keen one’s senses (apart from sight) are when sight is removed - something I’ve been aware of but not experienced as keenly. I’ve always felt I have a good sense of direction, but felt very disorientated and dependent on the group...*<sup>16</sup>

<sup>16</sup> Jour: 42-48

After returning from the morning’s activities she wrote:

“ Collection of ten items on the way back lovely - not used to doing this in nature reserve - I felt like a kid in a candy shop!”.<sup>17</sup> She did not feel that she had opened any new windows, but she liked the ideas used on the walk, noting them in her journal as ideas to use with her teachers.

<sup>17</sup> Jour: 71

Videos on the environmental problems facing the world were also shown, and these did make an impression on Carol. She found the video on the “Global Brain” startling and disturbing. She wrote:

*...but further idea of the expansion of consciousness, peace of mind not to be found in material things, idea that our limited sense of identity causes us to mistreat the world - I found this disturbing. “Leaky margins” of self is a wonderful image - to connect more with the world - actually feel this is happening to me in relation to my fellow students, seeing things differently living with them as opposed to just lecturing them.<sup>18</sup>*

<sup>18</sup> Jour: 89-100

She wrote, too, that what she learnt from the video made her worry about her children’s future.<sup>19</sup> She felt we need to make just a small start at putting the world right, but queried: “Another reason I feel hesitant to change is also selfish - why be the only one to suffer, although I realise that we will all go down in the end if things don’t change?”<sup>20</sup> Later in the course she mentioned the need to save beautiful creatures for future generations.<sup>21</sup>

<sup>19</sup> Ques 2:3 This illustrates some degree of dissonance, as Carol realises that she should do something, but doesn’t want to start.

Two simulation games were played: The Quality of Life shopping game impressed Carol because it showed that the “haves” tend to grab what they want without thinking of others needs. She wrote that she felt guilty about being a capitalist exploiter, but knew that she did not want to lose her modern comforts.<sup>22</sup> The Woolly Web game graphically illustrated how interlinked the environmental issues are, and therefore how difficult it is to solve environmental problems. While Carol enjoyed, and was impressed by the simulation games, she was also aware of how she could use them in her own teaching situation, and noted in her journal ideas to try.<sup>23</sup>

<sup>20</sup> Jour: 193-195 This shows what Winter and Reddy (1996) call the egocentric stance to the environment, but also reflects what Prawat (1996) refers to as the first stage of change - that of dissonance.

<sup>21</sup> Ques 3:4 This demonstrates what Ballantyne and Packer (1996:29), call a guardianship concept of EE.

<sup>22</sup> Jour: 166 - 171

<sup>23</sup> Jour: 134-154, Ques 2: 6

Another aspect of Workshop One which impressed Carol was the active participation, which opened her eyes to another aspect - that of getting to know her fellow students better. She wrote:

*I find myself not wanting to take charge but somehow still seem to be the pusher, otherwise I would feel very frustrated. This is an ongoing dilemma for me, although my fellow students are slowly starting to feel more confident - maybe I am very arrogant in feeling so (not superior, but faster than them). I hope to overcome this and learn from them as they*

and I increase in acceptance of our shared interests in this course.<sup>24</sup>

<sup>24</sup> Jour: 241-252

After the fourth workshop, she was able to say:

*I think the idea of the active participation business is essential for any, any sort of course like this. Again, very interesting having, having run courses with, with the Black teachers for the last eight years, and never actually doing something with them. It gives you a totally different perspective. Because when you are sitting there in the group and you're having to ... think with them, and you see how little they understand, that you think, "How on earth did I communicate... **did** I communicate with the teachers? Maybe I should have done things a little differently, my instructions weren't clear enough" - that sort of thing. So that, that has been an eye-opener, I should participate **with** them rather than the lecturer standing up in front and lecturing.<sup>25</sup>*

<sup>25</sup> Narr: 74-83  
There is a sense here, in the words used, that Carol still sees herself as different and separate from the other students. She has learned something about herself and her role as an INSET provider. Time did not allow us to determine whether she could make a change in her approach to her work.

If no new windows were opened onto the environment, having constructivism so graphically illustrated by the three candles burning in a bell jar was certainly a "new window". Carol wrote "...hilarious demonstration with candles... Very effective as it really had me stymied and madly de- reconstructing my previous ideas!"<sup>26</sup>

<sup>26</sup> Jour: 209-214

By the end of Workshop One Carol felt that she had gained a good understanding of continuous assessment, but that constructivism and journals and portfolios were still "poor".<sup>27</sup> She hoped for clarity on where education is going from the next workshop, and a way of linking all the activities and videos about the biophysical aspect of EE to the other aspects.<sup>28</sup>

<sup>27</sup> Ques 2:9, 10

<sup>28</sup> Ques 2: 8

#### 5.2.4.4 BETWEEN WORKSHOPS

After the first workshop, Carol found it very hard to settle to serious study. She started reading the Core Texts, but found some of them heavy going. She wrote: "I tackled Splitter and ended up straight back in the confused state I was in during philosophy in B.Ed."<sup>29</sup>

<sup>29</sup> Journ: 370  
Carol had expected the course to be easier than a B.Ed., but found this was not so. She was not the only one, and what she wrote here and below is a common sentiment of adult learners.

If it were not for an assignment, she would not have done much reading.<sup>30</sup>

<sup>30</sup> Ques 2:7

*By the time I get round to doing it, I'm feeling tired, so it ends up being on weekends and I've found that the only way I've been able to do it is to like, cram it into a weekend, normally the week before the assignment is due.*<sup>31</sup>

<sup>31</sup> Narr: 110-113

She battled with time management, and finally completed the assignment before completing the readings, and then found that she had to restructure the assignment to incorporate useful information gained from the readings.<sup>32</sup>

<sup>32</sup> Jour: 538-544

Carol's first concept map<sup>33</sup> showed that she had a clear understanding of the holistic nature of the environment and that the individual has a role to play by developing skills, values and attitudes which encourage negotiation in order to find solutions to environmental problems.

<sup>33</sup> Fig 4 p 47

The second workshop was a rather more theoretical one as we tackled the philosophy of modernism, EE philosophy and learning theories. Carol rejected these, writing that "they don't really seem to grab my attention", yet she claimed to be aware of the need to change to an EE approach,<sup>34</sup> "Despite promising myself to keep up to date with both this journal and reading, I have not been able to".<sup>35</sup> Carol said:

<sup>34</sup> Ques 3: 3, 6

*This course has required a tremendous amount of self-discipline, which I actually haven't had. I've been battling and it's the old story. When you start reading it [the text] you wish you'd read it longer and actively, and although [by the end of the course] we would have had six workshops..... We actually needed to have them ....closer together to keep you up with the reading, or to have the tutorial.*<sup>36</sup>

<sup>35</sup> Journ: 162-164

It needs to be noted that whilst commitment to further study means having to exercise all one's self-discipline, it is not easy for busy working mothers. Because of this she could not answer questions asked in questionnaire 3 at the time. She responded at a later date, showing a clearer understanding. Ques

She had made no entries in her journal during the workshop, but notes how the terms being used in OBE and Continuous Assessment workshops in her (professional situation) were becoming familiar.<sup>37</sup>

3:1, 2, 3, 5.

<sup>36</sup> Narr: 92-98

<sup>37</sup> Jour: 311-323

By the end of Workshop Two, Carol had a much clearer understanding of outcomes, continuous assessment, constructivism and how these will drive OBE.<sup>38</sup> This is partly due to Curriculum 2005 training at work and also to the fact that she had been part of a task team which put together a one-day training workshop on continuous assessment.

<sup>38</sup> Ques 3: 5

#### 5.2.4.5 FURTHER WORKSHOPS

Between Workshop 2 and 3 Carol did not get down to regular study, again leaving the reading and assignment to the last minute. She writes: "We really need to have the tutorials/tutor that was initially proposed. This sort of group/meeting would make me do more regular reading instead of leaving it to the day before".<sup>39</sup> However, when the research group decided to meet regularly, Carol absented herself two occasions saying that she had not done the readings and was not prepared.<sup>40</sup> As a result of the feeling of not being in control, Carol wrote: "I'm feeling very ambivalent about this course still, wondering whether it really is worth doing it as I don't seem to be getting to grips sufficiently with the material."<sup>41</sup>

Workshop Three was held in beautiful seaside surroundings at Morgan's Bay, and here Carol was again challenged by the need to "stop paying lip-service to these [EE] ideas and get down to it".<sup>42</sup> She noted in her journal:

*I feel helpless - want to pass the buck, i.e. "they" - the government, local authority or whoever must be responsible, take the lead. But we keep being told we all have to be responsible. The only way is to start inculcating EE values into children at a very young age. The adults are already too set in their selfish ways and too comfortable, so will resist change.*<sup>43</sup>

This tension which had been present in the course since the beginning, Carol found very uncomfortable, and it is this which contributed to her lack of discipline in reading about what "ought" and "ought not" to be done. It was still troubling her in June. She wrote: "I skim-read several articles..... all very interesting, but at the same time depressing - where is the world going to."<sup>44</sup>

Carol's second concept map<sup>45</sup> showed that she came to understand EE as a constructivist way of teaching/learning in order to protect and sustain the environment, in which outcomes (developing skills, values and attitudes) are assessed continuously. This showed a change in attitude from ego-centric (EE

<sup>39</sup>Journ: 636-640

<sup>40</sup>Her experience at workshops had been that she was not able to discuss readings, but rather had to explain them, and she did not feel confident to do this at this time.

<sup>41</sup>Journ: 655-659 This statement supports Hart's (1996) and Winter & Reddy's (1996) claim that unless a teacher feels the change is worth the effort, she will resist change

<sup>42</sup>Journ: 719-722

<sup>43</sup>Journ: 722-732

<sup>44</sup>Journ:1145- 1148

<sup>45</sup>Fig 7 p 51  
I find this at odds with what Carol writes. It seems that her head has changed, but not her heart. She knows what she "ought" to do, but resists doing it. (Sia *et al* 1985/6)

for human's sake - workshop One) to eco-centric (EE for the earth's sake -workshop Three).

On reflection halfway through the course, Carol found the Core Texts valuable, and assignments helped her to focus on reading and discipline her to do the readings, but she did not really find the journal useful,<sup>46</sup> although she said she had "enjoyed writing".<sup>47</sup> She felt that regular tutorials would have helped her discipline herself, although she said:

*Again, the tutorials you would need to have with your own... level. I find going out... and working with these other ladies.... they are at the wrong level for me. I would enjoy doing it with ... so that we can read at the same level... I've often found it a bit... not boring, but frustrating because I couldn't go at the speed I wanted to go.*<sup>48</sup>

Carol liked the idea of the interactive texts with "Stop and Reflect" and "Activity...", but she said that is slowed her reading down considerably, so she just made notes in the margin and wrote them up into a reflection in her journal at a later stage. She saw another drawback as being the time it took to do this, and "your planned study time suddenly evaporates and so you tend to skip. So it requires a lot more planning which I'm not actually good at".<sup>49</sup>

At this halfway point, Carol noted that she had a good understanding of EE and OBE, but still not enough to satisfy her. She felt that she was still some way from feeling confident about teaching EE or OBE.<sup>50</sup> This could be due to her difficulty in keeping a disciplined time for study. As a result of her experiences on the course, she felt she needed help with understanding how to work with adults, as her work is in INSET.<sup>51</sup>

As a result of this course, so far, Carol had become more critical of government documents, finding that she no longer accepted what they said as "the truth", but read them more critically.<sup>52</sup> She was also sceptical about the success of OBE due in part to the way it was being implemented, and partly because the INSET providers had not been sufficiently trained. She felt that it

<sup>46</sup> Ques 4: 4

<sup>47</sup> Narr: 126

<sup>48</sup> Narr: 98-104

<sup>49</sup> Narr: 139-153. As I work with Carol, I know that she is good at planning; this last statement seems to me to be an excuse!

<sup>50</sup> Ques 4: 5.2, 5.6

<sup>51</sup> Ques 4: 5.10 This comment raises the issue of education for INSET providers themselves - what needs to be done?

<sup>52</sup> Narr: 157-165

had become a case of “the blind leading the totally blind” which will cause teachers to opt out. A better plan, she said would be to implement OBE in pilot schools where teachers would trial OBE “for five years and then go on to the rest of the country”.<sup>53</sup>

<sup>53</sup>Narr: 172-174

As an INSET provider experiencing an outcomes-based certificate course, Carol supported the idea that INSET workshops should involve as much active participation as possible, but felt that because of the scarcity of INSET providers, the answer was “ get the subject associations going, and let them mentor each other... and then we could follow up them... once in a while”<sup>54</sup>

<sup>54</sup>Narr: 199-200

Carol did not change much in terms of knowledge about the environment. The greatest growth came in the challenge to change her attitude towards the environment and begin to live more sustainably than she had been. This battle is far from over; as she said in her journal, adults are too set in their ways to change.<sup>55</sup> Another area of positive growth was in constructivist teaching and learning strategies, and although, because of the nature of her work at the present time, Carol could not apply them often, she used them at every possible opportunity.<sup>56</sup>

<sup>55</sup> Journ: 732

<sup>56</sup> Ques 4:4 (extra comment)

#### 5.2.4.6 MY REFLECTIONS

Carol supported many comments made by the teachers, but raises too, the issue of INSET support for teachers undergoing change. How can teachers be offered adequate support when there are so few INSET providers? It seems subject associations or teachers support groups may offer a solution.

#### 5.2.5 THANDEKA - THE NON-PARTICIPANT TEACHER'S STORY

Thandeka grew up in the northern part of the Eastern Cape. She trained as a teacher, but only took up teaching after a three year stint in the private sector. She has taught at the same school for many years, and gets on well with her Principal. She writes: “She was so kind to me, showing me everything I did not sure about”.

Although she chose not to join the EE course she writes:

*This year Zibi and Sibongile are attending EE course. They are helping me a lot because they showed me how to write a Journal, and they are always telling me what they are doing during the course outings. I am also a Distance Education student under Fort Hare University. They are helping me in my course. I wish to pass at the end of the course.<sup>1</sup>*

#### **5.2.6 APRIL - THE NON-PARTICIPANT OBSERVER'S STORY**

April, who helped organise an Enviro Club at the school, introduced the idea of embarking on an EE course to the teachers, but because of the nature of her work, did not see them as regularly as she would have preferred. From my perspective, this was an advantage as it meant that she would notice any positive change more readily. She felt that as she did not deal with the teaching side of the Club, or ever saw the teachers in their classrooms, she was unable to comment on any change in the teachers' knowledge about the environment or education. (Narr: 107-109). However, she was able to discern a definite change in their enthusiasm. (Narr: 15-22). She felt that the topic that Sibongile chose for the Enviro Club competition showed that Sibongile was aware of her surroundings, and the problems of having Samango monkeys so close to the school (Narr: 33-34). April felt that because the school had not selected a tried-and-tested project like recycling or gardening, showed that the teachers were looking at their local environment in a different light. However, she was not able to see an improvement in the school surroundings and felt that they had, in fact deteriorated (Narr: 46). Although disappointed she was not prepared to prejudge the situation and when I explained to her the problems of theft and vandalism as explained to me by the teachers, April understood, as this is a common problem at schools. I put this down, not only to vandalism but also to the fact that Sibongile had said that she was bored with the Enviro Club (Sibongile Narr: 69), but having been on the Gold Fields EE course and learning more about the environment, had become more motivated, and keen to make a go of it (Sibongile Narr: 69-70).

April questioned the explanation given by Zibi as to why the nursery is not used to generate school funds (Zibi Narr: 214-226). She wondered whether this was an excuse, as in her experience, she had yet to meet a Black woman who could not grow plants (Narr: 109).

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<sup>1</sup>An aspect of INSET which Carol mentioned was that of teachers mentoring each other. Thandeka's comment seems to imply that in some cases this could work.

### 5.3 ANSWERING QUESTIONS AND SEEKING IMPLICATIONS FOR INSET

All my participants were sensitive to the biophysical environment and had some prior knowledge of and involvement in environmental education when they joined the course, but the knowledge was limited to conservation, and the involvement was in conjunction with someone more knowledgeable than themselves. This may be why they opted to upgrade their qualifications in this way. Similarly, the attitudes and values held by the participants, while illustrating a concern about the state of the environment, were not strong enough to result in personal action. (While one participant did recycle to a certain extent, she was not keen to live more sustainably.) None of the teachers had any understanding of outcomes-based education.

### 5.4 CHANGING CONSTRUCTS:

After the first workshop, I found that the hands-on experiences in the environment and the videos on the state of the planet played a part in awakening awareness of the global state of affairs and the need to preserve our own heritage. The example of recycling of waste at the EE Centre was a practical way to begin to own the problem and do something about it. The insight I gained for future INSET courses from the first workshop was that the impact of personal experience and exposure of all the senses to environmental issues must not be underrated (Sia *et al*, 1985/6, Hungerford and Volk 1990, Orr, 1992, Young, 1992). Facts can give knowledge and awareness, but only personal experience can develop or change attitudes needed to see real change. I believe that exposing people to the experience first, before any theory, gave them what I call a “WOW” experience, and initiated a change in attitude. The use of video material was problematic as the foreign accent of some of the videos, made it difficult to follow what was for many of the audience new information. I noted this as something to be aware of and perhaps, when using videos with English second language speakers, to explain the theme or underlying message of the video first, and to ask the viewers to discuss the topic after watching the video. Post-viewing discussion is important so that the viewers do not accept the lecturers view as “correct”, but form an independent opinion.

Similarly, actually playing games like the Woolly-web game made a visual impact on just how intricately interwoven the various environmental problems are, and how complicated the untangling becomes. These new experiences certainly made a big impact on each of them and left them with a desire for more knowledge, and the skills to do something about the situation. I believe that the novelty of the course, and the way it was organised had a lot to do with this. However, there is a

big “push” factor involved, as the teachers themselves noted - that of the called-for paradigm shift in National education. The “pull” factor is supplied by the feeling of dissatisfaction with the way in which schooling has been operating in the past. I concluded that this was a very useful way to sensitise teachers (whether urban or rural) to the richness of the local environment as a teaching resource. It seems that experiencing constructivist teaching and learning methods first hand has contributed to this growth, as has the assignment which required each person to generate knowledge for herself. These findings support those of Ballantyne and Packer (1996:29).

Ballantyne and Bain refer to three stages of conceptualisation of the environment (Winter & Reddy 1996). The first is *egocentric* which sees the environment as something important in our daily lives. The next stage is that of *guardianship* in which we care for the environment as a legacy for future generations and the third concept is an *ecocentric* one in which the environment and human life are seen as interdependent. The answers indicated that although there seemed to be an awareness of the need for environmental education (Sia *et al* 1985/6) there was at this stage, no deep commitment, and little personal involvement. This would suggest that the respondents were largely at the egocentric or guardianship stage. These findings are in accordance with those of Ballantyne & Packer (1996:30) who claim that for effective environmental education, it is necessary to address the three dimensions of environmental knowledge, attitudes/values and environmental behaviour in order to develop worthwhile environmental constructs. What became clear by this time was that the findings of first-world researchers did seem to be applicable to South African teachers, even though there was such a large difference in social background. This is, I believe, because Behaviourism has been (and still is to a large extent) the dominant teaching philosophy in the world today, and therefore we are not as far behind other countries as we think.

My findings following the second workshop showed that the teachers had become aware of the need to use teaching methods very different from those they experienced as learners, and which they used as teachers in the past. They had been exposed to constructivist learning and teaching theories, and the underpinning philosophy and therefore had a better understanding of what OBE entailed and this helped them to try out new teaching and assessment methods which they had themselves enjoyed. This was not a complete change, though. It was more a case of adapting where they felt confident, but all of them had begun to let learners work in groups. It is difficult to ascertain how much of this change was due to a “pull” towards constructivist teaching, and how much was a “push” factor imposed by the forced change in education in the near future, and a need

to come to terms with it. I believe that since none of the teachers had done the required readings by the time they completed the questionnaire, this change was due more to the “pull” of their experiences on the course.

This would seem to be an important aspect to note in the preparation of teachers for OBE. The more practical experience they get in a non-threatening situation, of designing learning programmes, and perhaps testing them out in simulated teaching situations, the easier they will find the change (Farnham & Diggory, 1994, Prawat, 1996). I think that for an INSET programme, a few suitable strategies could be shared with teachers, and all teachers asked to use them in some way in their teaching before the next workshop, and to reflect on their experience. I would encourage the teachers to involve their learners in the evaluation so that the learners knew that the teacher was trying something for the first time.

It appears that having interactive core texts to guide teachers through the theory is useful, but the teachers found the readings difficult and for all participants their busy lives meant that they chose to neglect the readings in favour of the assignment - this was problematic (Carol Journ.: 535-544), and so it seems that regular study groups (organised by the teachers themselves) are important to help develop knowledge. Vygotsky (1978) found that this was a necessary aspect of learning in children, and it seems it is important for adults, too. This correlates with the narratives (Carol Narr: 115-119, Sibongile Narr: 307-314, 339-344, Zibi Narr: 145-163). Another implication coming from this research, seems to be that when working with second language speakers, it is necessary to allow time for group reading activities, so that teachers can discuss what they read, and not be left to grapple with academic papers on their own. Even Carol, who already had a B.Ed., but who had not studied for a number of years, found some of the reading difficult. The teachers with whom I was working had not studied for higher degrees, and were unused to academic reading. During visits to the school I had noted that it appeared that the teachers were not coping with the readings, and I suggested that we form a study group and meet on a regular basis. This we did, and all of us benefited. It is not, however, feasible that INSET providers take part in such activities, since there are so few in the Region.

On reading the journals, it was clear that they were used more as a diary, and not as a way of interacting with the core texts. All participants had stated that they had problems with the use of journals (Carol Narr: 126-130, Sibongile Narr: 352-356). Biddle (1997), showed the value of using

a journal as a means to learning and a means of teaching. I suggest that teachers be taught this method through a practical workshop, and encouraged to stop and write in their journals within workshops whenever new concepts are being introduced, or teaching ideas explored, as a way of helping them to sort out the idea in their minds before sharing with others. Questions can be raised, concepts explained and ideas concretised. Teachers need to be encouraged to reflect on their teaching practice in their journals as part of ongoing Action Research. I have written elsewhere about the problem with journal writing. My participants come from an oral culture and an education system which did not teach them to think for themselves, and this may account for the difficulty they experienced.

## 5.5 CONCLUSION

True to the interpretative paradigm, the findings of this research raise more questions than answers (Guba & Lincoln, 1983: 315). However, by remaining focused on the goals of this research, and ignoring the other interesting questions for the moment, I believe that I have gained valuable insight into what these four participants perceived as having been instrumental in beginning to bring about a change in their understanding of EE and OBE. I can only suggest that change has begun, in a small way, with the acquisition of knowledge, backed up by personal experience, as in none of the participants has there been, at this stage, any marked change in behaviour, particularly environmental behaviour. Research has shown that change occurs slowly in adults (Etchberger & Shaw, 1992, Saunders, 1992, Ballantyne & Packer, 1996), (as long as nine years, Prawat, 1996:104).<sup>2</sup> For these reasons I can only make tentative claims. It would require research over a longer period to make more definite claims.

I suggest that these teachers were in a stage of what Doll called “internal reorganisation” (Doll, 1989: 250). They still need time to realise how all the activities they experienced are underpinned by theory, and so are not yet at a point where they can begin to plan integrated learning programmes. They have tried some new methodologies, seen the learner’s responses and have been encouraged, but now need to go to the next stage of reflecting on what the learners are learning, and how to sequence and assess the learning. Therefore it appears to be important for INSET to be offered in such a way that teachers understand where they have come from in terms of education and that they are given opportunities to voice their concerns and fears about the future.

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<sup>2</sup>This is a difficult process and follows a non-linear path as the educator goes through various stages because adults find dealing with dissonance very demanding. Often the benefits of making the effort are not seen as enough reason to make the effort, and we do not change (Winter & Reddy, 1996). (I wonder if this is part of the reason the men dropped out?).

The alternative methodologies should be presented in a constructivist paradigm such that teachers experience what their learners will do, and gain confidence in the methodologies so that they find the new methods more attractive, and continue to use them. It is important that teachers have opportunities to ask their questions, that the new methodologies are presented in an interactive way which helps teachers find answers to some of their questions and dispels a lot of their concerns. It seems that the process, as Fensham and Northfield (in Winter and Reddy, 1996:27) suggest, should be recursive rather than linear with consistent exposure to the new ideas and experiences over a period of time. Just how much constitutes “consistent exposure” will need to be ascertained by further Action Research.

### IMPLICATIONS FOR INSET

The current deficit model of INSET is inappropriate as a means of supporting teachers through the required paradigm shift. Bearing in mind the call by South African teacher educators (Higgs, 1990, Davidoff & Robinson, 1992) for developmental teacher education, and the open system of education required by post modern theories (Doll, 1989), I have to ask myself: “What have I learned from my participants which I need to take note of when planning INSET workshops in future, so that the teachers who attend will go away wanting to change to alternative teaching methods, with a better idea of their role as curriculum developers, and with skills to help them put their plans into action?”

It appears that future INSET should incorporate the following principles:

- I need to explore with teachers alternative teaching strategies, in a practical way where there is open dialogue and practical experience of the social construction of knowledge
- There is a need for teachers to understand the thinking behind the need to change, so that they are aware of current ideas on how learning occurs, and to explore a variety of ways of planning learning situations so that the learners grasp the important concepts.
- Where theory is needed, interactive texts with classroom-based activities, are essential.
- I need to be aware of ways to monitor change occurring in teachers so that I can give them the encouragement and support they need. This can be achieved by encouraging teachers to reflect on their teaching (Fien & Rawling, 1996).
- Teachers need time to consolidate the small changes that they do make. If not given this time, there is a chance that teachers may revert to old familiar methods and reject the alternatives (Bishop, 1997). Therefore INSET should not be “once-off”, but consist of a series of developmental workshops, with time in between.

- Teachers need the support of their EDO, Subject Advisor and INSET provider, as well as their colleagues, both in the school and in subject/learning area associations. For this, INSET needs to move out to the schools where teachers can become agents of change in their classrooms.

To this end, I have begun designing INSET workshops utilising the advice suggested by my research participants. It only remains for me to reflect on the process in which I have been involved, and this I do in Chapter 6.

## CHAPTER 6

### CRITICAL REFLECTION ON THE RESEARCH PARADIGM AND TOOLS

#### 6.1 INTRODUCTION:

Guided by the findings of researchers working in teacher education in other countries, particularly Sia *et al* (1985/6), Barrow (1990), Robinson (1992), White and Gunstone (1992), Fien (1993), and Ballantyne and Packer (1996), as well as Stiles, (1996) and Winter and Reddy, (1996) in Southern Africa, my research aimed to ascertain from teachers themselves what aspects of an environmental education course were pertinent in developing their understanding of EE, and how this approach to education could inform future INSET programmes necessary to assist teachers in making a change from the traditional transmission style of teaching, to transformational OBE, because, as Ballantyne and Packer point out: “Research is needed to ... design, develop and test specific teaching strategies for developing environmental conceptions that address the cognitive, affective and behavioural dimensions...” (Ballantyne & Packer, 1996:31). I felt I was justified in doing this since an analysis of documents relating to the new education system in South Africa shows that the philosophy underpinning Curriculum 2005, and therefore the related learning theories, is the same as that of the New Environmental Paradigm.

#### 6.2. INTERPRETATIVE RESEARCH

Coming as I do from a scientific background, I balked at doing research with so few people, research which had no planned goal, which was “touchy-feely” and which might not reveal any “worthwhile” information which could be applied generally. However, I wanted to know teachers’ perceptions, and could not possibly get the depth that I felt I needed, from large-scale surveys, which would have had to have been questionnaires. I also felt uncomfortable in that while scientific research on people claims to have collected data from a statistically significant number of people, the interpretation is still that of one person, whereas interpretative research would at least present the views of all the people involved. My experience through this case study has led me accept that when people are the subjects of the research, interpretative research is by far the superior method.

This was not my first attempt at interpretative research. I had done a very small case study as an assignment in the course of a B.Ed. and I had thoroughly enjoyed meeting strangers and learning something of their world. I looked forward to the months ahead, thinking that this would be just a

bigger version of my B.Ed. assignment. I was to learn that qualitative research, unlike a scientific experiment in a laboratory, could not be planned and executed when it suited me. People are not laboratory animals. I could not always get to see the people when I wanted to; they required time to consider the questionnaires; they sometimes forgot that I was coming to see them. When we were at EE workshops, they found the work tiring, and did not want the added load of answering questionnaires, being interviewed or making concept maps, and between workshops, their busy lives meant that they often left their studies until just before the next workshop, which meant that I could not gather new data. All very frustrating! I underestimated the time I would need to spend transcribing audio tapes and reading and analysing journals; time needed to go back to the participants and clarify things they had written or said. On the positive side though, I could never have found out as much as I did if I had simply done experiments, and used only my own interpretation of events. I would not have learned to “let go” as Ely *et al* (1991:35) put it, become more flexible and trust the method. I would not have grown in myself, or made new friends.

There are a number of constraints to interpretative research, as I experienced it. One constraint I found was that the research seems to take a life of its own and grow bigger, requiring constant reflection on what could be achieved within the time constraint of a half thesis resulting in tension between a need to control the research and a desire to be flexible. Another was that by becoming involved in the lives of the people, to the extent that they trusted me, meant that I came close enough to see the “warts”. Should I include these, where they were pertinent to this research, or disregard them, so as not to hurt the feelings of the person (who is probably unaware of them)? I chose to be honest and say what I thought as tactfully as possible, but to remove any comments which participants felt were not a true reflection. This I was not asked to do.

### 6.3 QUESTIONNAIRES

One of the weaknesses of using a questionnaire is that the respondents may not understand one or more questions, in the sense that was intended, or because of the language. This is exacerbated by having to respond in a second language. In the Pre-course questionnaire the teachers did not understand what was meant by cross-curricular activities, and I had to explain it to all three of them. None of them used this teaching method in their classes, even though they taught all the subjects to their learners. I was fortunate to be on hand while the respondents filled in their responses, and was able to solve this problem. Had I not been there, I would not have known that they did not understand that term, and I would have interpreted the responses differently. The

Pre-questionnaire, while achieving its purpose, raised more questions which I hoped to be able to answer as I got to know the teachers better - questions such as their exposure to the natural environment in childhood and their feelings about the coming educational changes.

In Questionnaire 3 I had left a lot of space for written responses. I was disappointed in the sparseness of the replies, and in the fact that where feelings were sought, the respondents gave clinical answers as though they were answering exam questions testing their knowledge. Is this a result of a lack of experience of writing about feelings, or did they just not understand my questions? Perhaps I should have explained more carefully what I meant. This is a weakness of the questionnaire as I was unable to stress certain words or to probe deeper, and maybe rephrase the question, as I could have done with an interview. When eliciting perceptions from second language speakers it is important to make sure that the questions are clear. I should have run a pilot questionnaire. I did not have time to do this as the workshops were quite close together, and the respondents kept busy with readings and assignments. I found little time for administering, collecting and analysing each questionnaire, before preparing the next one. This is noted as one of the constraints of research for a half-thesis using the interpretative paradigm.

#### 6.4 INTERVIEWS

I have chosen to separate interviews into two categories. The recorded semi-structured conversations I have called narratives, and reflect on these separately. I used interviews to clarify questionnaire responses, and only the first of these was what could be called a formal interview. Most of the time I was able to clarify issues through informal conversations. This I found was a strength of the research paradigm. As a trusted member of the group, I was able to drop questions into our conversations. It was not appropriate to record the responses immediately, but I made a point of writing them up into my field notes as soon as I could. I therefore enjoyed the advantages of the interview, as reported in Chapter 3, and minimised the disadvantages. When working with second language speakers, I consider the use of interviews in this way to be vital in ensuring that the interpretation is not only that of the researcher.

Apart from the interviews with my participants, I interviewed the Wildlife Education Officer, as a form of triangulation. I had considered using a questionnaire, but found that the use of a recorded interview/conversation served the purpose much better, as we were free to explore ideas as they

presented themselves. This turned out to be a valuable exercise, as April gave me a different perspective on my participants.

## 6.5 REFLECTIVE JOURNALS

I found that at first the participants did not understand what was meant by a “reflective journal” and most of the information gathered was simply a collection of diary entries, which gave no insight into the meaning the person was making of the situation. The course organisers read the journals regularly and commented on this, which had the effect of upsetting the respondents and making them feel they were failing. I see the journal as a valuable tool for helping teachers to internalise new ideas, to share them with others, and so begin to make new constructs. However, it seems that the idea of journal writing is so new, that time ought to be spent doing an exercise to give teachers an idea of what a journal should be. As time passed, the participants began to reflect, but this was quite a foreign concept to them. The time constraints on this research did not allow me to detect any notable difference, and I query the value of the journal in a certificate course, unless introduced with care. Even where a reflective journal was used in the accepted sense, I found that I could not help putting my own interpretation on what I read, and this could affect the data.

Journals are time-consuming to analyse and interpret because before analysis, the lines had to be numbered for reference purposes. In this case study, the journals were best used to corroborate information collected by other instruments. These comments do not mean that I reject the journal as a research tool. On the contrary, I believe that they can be an extremely rich primary source of data.

## 6.6 NARRATIVES

I had deliberately made every attempt to make the experience of recording the narrative as similar as possible for all the respondents, so that the context would have as little influence as possible, and yet the context couldn't have turned out more differently. I have to ask: Is the context that important? Would Carol have been more relaxed if we had just sat in her office and chatted? (I had thought of that, but the chore of transcribing what I knew would be a long conversation, steered me towards the more structured choice!) I had not asked any of the respondents how they would have liked the narrative to be conducted, and while my motive for offering a meal was that of spoiling them, while giving time to develop a relaxed atmosphere, it had the opposite effect on Carol. I would, in future, ask each participant what would suit them. I do not, however, regret the way

things turned out as it taught me that while I may think I am treating everyone the same, they do not all interpret the experience in the same way, and this gave me valuable insight into my work with adults.

At this stage of the research, I had not thought through how I was going to present my “findings”, but they ended up presenting themselves. I found that by structuring the narrative as I did, I inadvertently laid the plan for the stories. I had intended to use the narrative to corroborate data from other tools; instead, I chose rather to add in the data from the other tools, which had not been covered in the narrative, look for corroborating statements from the other research tools, and add my “voice”. This was an unexpected advantage of the flexibility of the interpretative paradigm.

From an INSET point of view, I thought it would be good to hear from Thandeka how she had been affected by what her colleagues had learnt, and as I was unable to find time to speak to her, I asked her if she would like to write “her story” for me, which she did. This was not as successful as a recorded interview would have been, as she gave me very little that helped me to understand whether my participants had “cascaded” their learning. Whilst I could claim that her willingness to help might have been indicative of positive learning experiences, I would not do this again, but rather make the time to interview the person.

## 6.7 CONCEPT MAPS

This tool was not intended to be a major source to data collection and was included partly as an experimental approach. I learned so much about using them that I have devoted more space to the discussion than they warrant.

I chose to ask each respondent to make her own concept map as I wanted their individual understandings, for this thesis. It is often more appropriate to allow a group of people to work together on the construction of the map. The advantage of this is that the input from each group member can aid the understanding of the others.

I deliberately left the participants to make their maps on their own, so that I could not influence the outcome in any way, and as a result the exercise was not as successful as I had hoped. Some respondents did not write along the lines the reasons for linking the concepts, in spite of the importance of this being stressed. In such cases it was only possible to ascertain that the respondent saw some sort of link between the two. In spite of this I have not rejected the concept maps

because I feel that they contained valuable information, more as a result of what was missing than by what was there. Had I assumed a bigger change in the teachers than was actually there? Were the changes still so tentative that the teachers had not had time to reconstruct their understanding? What response would I have got if I had introduced the concept map much later in the year?

I cannot answer these questions and I have to take responsibility for the poor response to concept maps. I had assumed that because I was working with teachers, they would understand what was required after a verbal explanation and having been given an example. This was a false assumption. On reflection, I might have realised that for the teachers who had come through the Apartheid system of teacher education, where information was contained in separate syllabuses, (and separate topics within syllabuses), making links between ideas was likely to be a new approach. (Novak & Gowin (1984) found they needed to introduce concept maps to both adults and children in a step by step fashion). Another cause could be that the teachers were required to link concepts in their second language and may have found it difficult to express their understanding in a short phrase. Had they made these maps in Xhosa, would they have been better able to articulate their perceived links? Carol, an English First language speaker certainly made more sophisticated maps, but she had also been exposed to concept maps before. I am fortunate in that I have access to the teachers and can go back and explain concept maps thoroughly and ask them to make the two maps again (as Novak & Gowin (1984) recommend). I will record our discussion of the maps so that I can analyse what is said to generate further insight into the usefulness of concept mapping with second language speakers, but these maps will not form part of this research. As a research tool, I consider the concept map, properly used, to be a very useful method of gathering a rich source of data in a way which does not require the researcher to be present, and which gives a visual picture of learning. I would certainly use concept maps again, to map prior knowledge, as well as the learning process.

## 6.8 CONCLUSION

My curiosity was aroused because of the unique situation in South African education at this time. The South African education system seemed to me to be making a giant leap from what I could term the "dark ages" of educational theory, to the "new enlightened age", without going through a transition stage. In studying the earliest government document on the Reconstruction and Development Programme (South Africa, 1994), it became clear to me that the kind of education being mooted was what I understood to be environmental education. Because I have had a

long-term and active interest in environmental education, and as a result of further insight into teacher education, philosophy and learning theories gained in the course of the first year of this two-year degree, I held certain beliefs about what constituted good teacher education. Furthermore, I was not satisfied with the model of INSET being offered, seeing it as crisis management, rather than what I felt it should be - that of teacher development. However, I was not educated in South Africa and I come from a different cultural group to the majority of South Africans and could not be certain that my understanding of "good teacher education" would in fact meet the needs of the people with whom I worked.

The EE course offered me the opportunity to find answers to my questions. Firstly it was based on EE philosophy, secondly, it aimed to introduce the participants to OBE, and thirdly it was itself an INSET programme, allowing me to work alongside participants and find out firsthand what aspects of the course had the most impact on them (Robinson, 1992). I was aware of Tilbury's (1994) claim that women approach issues differently from men, and it is a shortcoming of this research that none of my participants were male. On the other hand, since all but one of the men dropped out of the course, I was pleased to have avoided that problem! The reasons for the high male dropout from this type of programme needs to be investigated, as it has implications for INSET.

Whilst the focus of this research was teachers' perceptions of change, the reason for this was to give me insight into what might help teachers on INSET courses to make the called for paradigm shift from the familiar transmission method to the post modern constructivist methods of Curriculum 2005. The current model of INSET makes the assumption that teachers fall into one of two group. Either they are seen as having sufficient training and therefore in need only of enrichment, or they are assumed to be "below standard" and in need of some sort of intervention training to bring them up to standard. Neither the enrichment nor the deficit model can develop the quality of teacher envisioned by the Government documents relating to teacher education. New approaches need to be developed which will encourage teachers to reconstruct their beliefs about teaching and learning (Prawat, 1992), whilst taking cognisance of Robinson's (1992) warning that teachers' voices need to be heard, as do those of researchers such as Orr (1992) and Ballantyne and Packer, (1996) Ransom *et al* (1996) and Stiles, (1996).

There is therefore an urgent need to re-educate in-service teachers in the philosophy, and related methodologies underpinning Curriculum 2005. Environmental education, based as it is on the New

Environmental Paradigm (Fien, 1993), offers constructivist teaching and learning methodologies compatible with the principles of the white paper for education (South Africa 1995a), and has the added advantage of educating people in such a way that the environment is protected (Huckle 1986, Huckle 1991, Klein & Merritt, 1994).

Two final questions need to be asked: Will it be possible to help teachers change their world view quickly enough to implement OBE within the time-frame envisaged by the National Government? What about the teacher educators? Until the teacher educators make a paradigm shift to constructivism we will only be paying lip service to the new paradigm by using the new terms or incorporating activities into our programmes.

TBILISI PRINCIPLES

Environmental Education should:

1. consider the environment in its totality - natural and built, technological and social (economic, political, cultural-historical, moral, aesthetic);
2. be a continuous lifelong process, beginning at the pre-school level and continuing through all formal and non-formal stages;
3. be interdisciplinary in its approach, drawing on the specific content of each discipline in making possible a holistic and balanced perspective;
4. examine major environmental issues from local, regional, national and international points of view so that students receive insights into environmental conditions in other geographical areas;
5. focus on current and potential environmental situations while taking into account the historical perspective;
6. promote the value and necessity of local, national and international co-operation in the prevention and solution of environmental problems;
7. explicitly consider environmental aspects in plans for development and growth;
8. enable learners to have a role in planning their learning experiences and provide an opportunity for making decisions and accepting their consequences;
9. relate environmental sensitivity, knowledge, problem-solving skills and values clarification to every age, but with special emphasis on environmental sensitivity to the learner's own community in early years;
10. help learners discover the symptoms and real causes of environmental problems;
11. emphasize the complexity of environmental problems and thus the need to develop critical thinking and problem-solving skills;
12. utilize diverse learning environments and a broad array of educational approaches to teaching/learning about and from the environment with due stress on practical activities and firsthand experience.

UNESCO (1977)

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