ENVIRONMENTAL EDUCATION AND THE CROSS-CURRICULAR NATURE OF OUTCOMES BASED EDUCATION: AN INVESTIGATION OF METHODOLOGICAL COMPATIBILITY

by

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Summary

This study is an investigation of the congruence in methodology between outcomes-based education and environmental education. EE and OBE advocate for an integration of educational approaches and methodologies. The focus being the introduction of integrated cross-curricula approach to education.

Questionnaires were administered to educators in the sampled schools in order to get the understanding and perceptions of educators about the compatibility of EE and OBE methodologies. The hypothesis: OBE in South African Education allows for the implementation of EE methodologies.

The finding is that common approaches i.e. interdisciplinary and cross-curricular approaches and similar methods are used in OBE and EE.

Several proposals were made: There should be workshops, support and mentoring approaches to EE and OBE. Resources should be available to educators and learners and there should be research on OBE and EE methodologies should be made.

Key terms: Environmental education; Outcomes-based education; Methodology; Compatibility; Approaches; Holistic; Cross-curricular approach; Paradigm; Constructivism; Holism; Integration
Abstract

This study is aimed at examining the compatibility in methodology and approaches of South African Outcomes Based Education and Environmental Education. Data collection was based on questionnaires administered to the primary school educators in the Rustenburg District. Extensive knowledge was gained concerning the nature, approaches and methodologies of Environmental Education and Outcomes Based Education. The educators’ understanding of the compatibility or degree of agreement between OBE and EE methodologies, approaches and methods was examined. Problems related to the methodological incompatibility of EE and OBE are identified and solutions are proposed.

The core of this study is to examine the compatibility between OBE and EE in terms of approaches and methodologies. It is noted by this study that compatibility between EE and OBE, is not without problems.

This study will make valuable contributions to examine the extent of OBE as a curriculum policy for addressing methodological issues raised by EE.
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Thanks to the All Mighty for the energy, focus, strength and wisdom that helped me through.
Declaration.

"I declare that Environmental Education and the cross curricular nature of Out comes Based Education: an investigation of methodological congruence is my own work and that all sources that I have used or quoted have been indicated and acknowledged by means of complete references".

Date:..............................................................................
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Chapter 1

Background and problem formulation

1.1 Introduction

Environmental Education (EE) has rejected the 20th century compartmentalized, sectional and atomistic education. EE has called for an education that is holistic, broad and cross-curricular. The integration of knowledge is fundamental to the approaches and methodology of EE.

In 1995 Outcomes-based Education (OBE) was introduced in South Africa as a new educational policy. The philosophy and the approaches of OBE are geared towards solving vexing problems that come with the 20th century education in general and apartheid education in particular.

Questions that arise are: Does Outcomes-based Education in South Africa allow for cross-curricular teaching as proposed by Environmental Education? Does OBE allow for the implementation of EE methods and approaches? These are the issues and questions to be interrogated by this study.

Chapter one aims to provide the researcher and the reader with a prelude, focus and direction. The focus will be on the following:

- Problem formulation and background to this study.
- Definition of concepts.
1.2 Background and problem formulation.

1.2.1 On the origins of EE

Weibacher (1993: 4), in his book 'The Renaissance of the Naturalist', expresses the need for EE by saying:

"... It is time now for a new cycle. It is time for environmental educators to cycle back upon history and embrace the single most important aspect of our work: We must train a new generation of naturalists. That's a right naturalist. As ozone holes widen and green house gasses rise, as habitats vanish and wetlands disappear, it is time to make that near extinct endeavor -nature study- once again a core mission of environmental education. In a world where diversity dwindles daily, we must remember the names of the natural neighbors that share our communities."

The increase of environmental issues in the past 30 years triggered human instinct to protect life-sustaining elements of nature in the form of conservation and eventually EE. Pollution, desertification, poverty, population explosion, deforestation, ozone depletion, growth of slums and informal settlements, acid rain, decline of marine and terrestrial life, militarization, nuclear pollution, inter-alia, triggered warning signals throughout the world - man's survival depends on adequate redress of his way of life or else he would face oblivion.

Irwin (1991:1), on the origins of EE stated that:

"Over the past five decades environmental education has evolved from a surrogate of nature conservation and vague notion relating to a better ' quality
of life', to a sophisticated concept embracing ecological knowledge and understanding, total people - environment relationship, ethics, politics, sociobiology and public participation in decision making. Along side this evolution of ideas, over the past 20 years in particular, considerable effort has been expend internationally to clarify and delineate the concept environmental education. This has involved a great deal of debate and discussion both in environmental and educational literature and at international forums."

Beyond Irwin's arguments on the nature and definition of EE, various attempts have been made internationally and locally to delineate the boundaries and define what EE stands for. To this effect various international conferences and events indicated the need for EE (UNESCO-UNEP 1976:1-2).

Environmental problems unquestioningly result from socio-economic situations and inappropriate human behavior patterns (poverty; uncontrolled economic growth; squandering of natural resources) (UNESCO-UNEP 1988:6).

EE is concerned with the approaches and methods of teaching. EE focuses on the total development of a child. It represents a departure from factual presentation of information to holistic personal and behavioral development. EE also represents a departure from discipline-based, reductionistic, mechanistic education to cross-curricular, holistic, integrative and broad-based child centered education (Tyldeskey: 1990: 23).

Bennet (1985:13) agrees with Tyldeskey (1990:25) that EE is characterized by various methods of teaching. Emphasis should be on the experience of the learner, which involves observing, collecting and reading of data including discussions (Swartland 1988:46). Environmental programs should encourage learners to look at their surroundings with a more practiced eye, a more involved heart and a more responsible mind (Wolsk 1977:107). Various methods are encouraged: field trips, mapping, development of gardens, simulations, games, concretization, et cetera.
However, Ballantine and Tooth-Aston (1987:4-7), Hale (1986), Hurry (1984:33-37) and Vulliamy (1987:14) suggest that EE should not be introduced as a new subject rather as an approach to teaching. Several countries attempted to introduce EE into the curricula as an approach to teaching, including South Africa (Irwin 1981:4 and Hurry 1981:7).

1.2.2 The introduction of OBE in South Africa

1994 ushered a new dispensation in politics as well as in education in South Africa. A new education system called Outcomes-Based Education was adopted. The introduction of OBE radically transformed the approaches and methods of teaching in South Africa. (The roots, characteristics and approaches of OBE are discussed in detail in Chapter 2.)


Both OBE and EE encourage the eradication of a disciplined approach to knowledge, acknowledged existentialism, phenomenology, critical theory and personal theorizing. This broad methodological agreement between EE and OBE approaches prompted this research. This research will attempt to answer the question:

To what extent does OBE in South Africa accommodate EE approaches and methodology? Or to what extent does OBE as an educational policy address methodological issues that have been raised by EE?
1.2.3 Hypothesis.

This study is guided by a well defined hypothesis: OBE in South Africa allows for the implementation of methodologies and approaches of EE.

1.3 Aim and motivation of this research.

'Victory!', is this an excitement exclamation or a reality?
The eminent compatibility between EE and OBE calls for a research to establish the reality or a facade that may be prompted by a new dispensation in education. There is a need to establish the compatibility between OBE and EE approaches and methods. This will facilitate the proper application of EE processes and approaches in the new educational dispensation (Tselane and Mosidi 1988:5, Van Rensburg 1988:15).

In the opinion of the researcher there is a need to explore theory and practice of both OBE and EE. This research will also explore synergy that emerges from proper implementation of EE methods and approaches in OBE and C2005. Various authors argue that the introduction of OBE represents the conclusion of a long struggle of EE to effect transformation in education but little research has been done to determine the extent of this 'victory' (Tselane and Mosidi 1988:7, Lotz et al 1988:6-7 and Janse van Rensburg 1988:14).

The study will also attempt to answer the following questions:
What is the understanding and perceptions of teachers on
• the approaches to teaching proposed by OBE and EE?
• the application of EE methods in OBE?
• the problems experienced in the application of EE and OBE methods and approaches?

1.4 Definition and discussion of concepts

The following concepts will be defined and discussed:

- Environmental Education
- Outcomes-Based Education
- Cross-curricular approach
- Approach
- Methodology
- Compatibility
- Paradigm Shift
- Constructivism
- Atomism
- Holism

1.4.1 Environmental Education: The modern concept of EE was developed during the 19th century (Irwin 1990:4). Many attempts have since been made to define the concept EE internationally and locally. The International Union for the Conservation of Nature and Natural resource's definition is the most accepted (Irwin 1990:5). It reads:

"Environmental Education is a process of recognizing values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the interrelatedness among man, his culture and his biophysical surroundings. Environmental Education also entails practice in decision making and self formulation of a code of behavior about issues concerning environmental quality." (IUCN 1970:3)
Irwin (1991:5) regards this definition as adequate as it contains all necessary EE elements: inter-relatedness, values, attitudes, skills, norms and decision making.

To the researcher EE is a way of life. It regulates the rhythm of every social fabric, be it politics, economics, culture and entertainment. It is a pivot around which man's values, norms, morals, ethics, behavioral patterns, interactions, sustainability, attitudes, perceptions and generally man environment relationships should grow.

EE represents one of the most important curricular issues, it connects directly to the quality of life and education. The connection between education and the quality of life including the environment has been sacrificed by the 20th century education.

EE is about relationships that develop as a result of social activities and interactions between the biotic and abiotic, relationships that go beyond human relations. Cultures and social, economic and political systems evolved as a result of relationships that are explained, defined and monitored by EE.

EE is also about developing a proper curriculum that addresses all human domains. A curriculum that addresses specific values, norms, and attitudes including behavior. It calls for action, action that will improve the quality of the environment and all those who benefit from it.

1.4.2 Outcome-Based Education: OBE has been defined differently by different authors (McKernan 1993:344, Gusky 1998:5Xiii and Boschee & Baron 1994:574). All these definitions are referred to in Chapter 2:2.6.1.

However OBE is commonly defined as the following:

"OBE means organizing for results: basing what we do instructionally on the outcomes we want to achieve ... outcome-based practitioners start by
determining the knowledge, competencies, and qualities they want students to be able to demonstrate when they finish school and face the challenges and opportunities of the adult world ... OBE therefore is not a "program" but a way of designing, delivering and documenting instruction in terms of its intended goals and outcomes" (Spady 1988:5 in Mc Kernan 1993:344)

Broadly OBE definitions focus on the following:

- Developing clearly defined outcomes that all learners must achieve
- Defining teaching and learning that ensures the demonstration of these outcomes
- Monitoring individual student progress on the basis of demonstrated performance
- Utilizing criterion referenced assessment both to monitor progress and to group students
- Provide remediation for students who do not achieve the outcomes quickly and enrichment for those who do.

1.4.3 Cross-curricular approach: This concept flows from the Gestalt theory that the whole is more than the sum of its parts (Irwin 1981:9-14). It emphasizes holism. In EE and OBE it is used to indicate integration of knowledge across various disciplines. It is a break away from compartmentalization, atomism and mechanistic view of knowledge. It is an approach to teaching... it is a premise of operation (These concepts are further explained in chapter 2:2.4).

EE and OBE have adopted a cross-curricula approach in their development and application of knowledge. This similarity in approach (cross-curricular) in OBE and EE has prompted this research. One of the core issues that will be discussed includes the unpacking of what cross-curricular approach means for EE and OBE and to what extent are they complementary.

1.4.4 Approach: Various disciplines have different approaches. EE has its own approaches and so does OBE.
Webster's New International Dictionary (1986:104) defines an approach as:

"To create a desired point of view or result... to take preliminary steps towards accomplishment of knowledge or experience or task or subject... taking tentative or introductory steps for a particular purpose... for accomplishment"

Various bodies of knowledge apply various processes in order to accomplish the desired outcomes. The sum of the processes produces an approach, a way of doing things. OBE and EE have adopted an integrated approach to knowledge that is generally referred to in this study as a cross-curricular approach.

1.4.5 Methodology: Webster's New International Dictionary (1986:1422) defines methodology as:

"... a procedure or process for attaining an objective... it also encompasses a mode, manner, way, fashion, system, means used or procedures followed in doing a given kind of task or work or achieving an end.... It implies orderly, logical, effective plan or procedure... connoting also regularity."

Methodology for purposes of this research also includes approaches being followed such as the cross-curricular and the interdisciplinary approaches. EE and OBE share a lot of similarities in terms of the procedures, modes, processes or plans that aim at attaining an integrated cross-curricular approach.

1.4.6 Compatibility:

"... to be able to exist together without discord or disharmony... so related that both may be true... non contradictory." (Webster's New International Dictionary 1986:461)

Is there any element of compatibility between OBE and EE in terms of methodologies and approaches? Can OBE and EE exist together without
disharmony or discord? Is there any contradiction between OBE and EE methodologies and approaches? These are the questions to be answered by this study.

1.4.7 Paradigm and Paradigm Shift: A paradigm is a “frame of reference” based on a particular set of ideas (that differ from other sets of ideas), a particular way of looking at, making sense of, and dealing with the world – in this case education.

Various paradigms are referred to in this study, paradigms or sets of ideas that have characterized education. Atomistic, reductionistic and disciplined approaches form a set of ideas different from holistic, integrated and cross-curricular approaches. The research will refer to these paradigms from time to time and how these paradigms shift. Paradigms or a set of beliefs constantly change with time and change in space. This study shall refer to various beliefs in education and how these beliefs have changed in space and time.

1.4.7 Atomism: Describes a view in which things are seen in a fragmented or unconnected way. This concept is used frequently in this study to describe the curriculum that does not see knowledge in an integrated way. Various elements and concepts are seen as separate and unconnected.

1.4.8 Holism: Describes a view in which things are seen in an integrated way, not as separate unrelated items. It is the opposite of atomism. The education system of South Africa has always treated knowledge as separate entities. This is evident in the discipline-based approach of the Department of Education. Holism is an integral part of OBE and EE. This study will investigate what the degree of holism is in EE and in OBE in South Africa.
1.4.9 Constructivism: This is the notion that learners can internalize, reshape and transform knowledge (Brooks & Brooks 1993:34). Learners can create new knowledge. Questioning, investigation, problem generation and solving are integral to constructivism. Constructivist principles have a lot in common with OBE and EE. In fact constructivist instructional methods are encouraged by both EE and OBE. This study shall refer to the concept in illustration of its relevance to OBE (C2005) and EE.

1.5 Methodology

A research methodological approach should not be confused with research methods (Walford 1991:201 and Cohen & Manion 1989:20-27). A methodological approach could be regarded as a paradigm. Two research paradigms have been identified by Cohen & Manion (1989:6-7): positivistic and phenomenological paradigms. Positivism has its roots in the 19th century empiricism that holds science and mathematics as core research. Advocates of positivism believe in absolutism and a perfect 'truth' including objectivity. Phenomenology, on the other hand, believes in a human science approach to research. It believes in multiple social causality that may not be socially defined. There is no external reality and absolute truth (Cohen & Manion 1989:27).

A phenomenological paradigm becomes an obvious choice for this study as EE approaches reject the use of mathematical formulas to describe human behavior. The EE approaches further reject absolute truth, modification of human behavior and scientific experimentation to explain and predict. EE applies human science approaches and cuts across a variety of traditions holistically (Miles & Huberman 1994:35).

Miles & Huberman (1984:23) maintain that a phenomenological approach is rich in description and explanation of processes occurring at a local level. It can also preserve chronological flow, assess local causality and derive fruitful explanations.
1.5.1 Methods and data collection techniques

Various methods are recommended for a credible qualitative research to be conducted (Hammersley 1991:76). A survey method has been selected for this study. Surveys are used with a variety of intentions, *inter-alia*, to determine the relationships that exist between specific events (Cohen & Manion 1989:97).

Due to limited time frames of this study, questionnaires will be conducted to generate data for this study. Despite the fact that designing questionnaires requires time and effort, it allows collection of data from a large sample faster than other alternatives. The study covers a large sample of 89 Primary Educators in the Rustenburg district. The principals of the respective schools will administer the questionnaires. This will add more value to the exercise than if the researcher was to administer them (Cohen & Manion 1989:99)

The data collected will then be analyzed quantitatively and qualitatively. Data will be grouped into three categories. The first category will deal with the understanding and perceptions of educators with regard to EE approaches and methodologies, the second category will deal with the understanding and perceptions of methodologies and approaches of OBE by educators and the third category will deal with the compatibility between EE and OBE approaches and methodologies as perceived by educators.

The results will then be interpreted and presented. Further research possibilities will be alluded to and conclusions will be presented.

1.5.2 Research questionnaires

The questionnaires will be administered to the teachers at the selected schools. Appointments were made with respective principals to administer the
questionnaires 10 minutes before the end of the day (See Appendix A: Questionnaire schedule for teachers). The principals have agreed to collect the questionnaires and submit them to the researcher within a week of the appointment.

1.5.3 Research Respondents

All research respondents were selected from the Rustenburg District in the North-West. The research subjects for this study comprise of 10 primary school teachers.

These respondents were chosen given their position and knowledge of EE. They are also involved in the implementation and application of EE and OBE. Their responses would be very valuable to this study.

The 10 Primary schools (10% of all Primaries) are Bothibello, Borite, Tumagole, Monakato, Mogono, Lekwakwa, Tlaseng, Letsibogo, Zinniaville and Thusanong combined Farm School. The schools are located at different parts of the Rustenburg District and the following factors were considered: geographic location, urban or rural schools, private or government schools and mainstream or farm schools (see Appendix B: Rustenburg district map).

1.5.4 Data analysis

Data analysis will involve both quantitative and qualitative descriptions of the questionnaire responses (Cohen & Manion 1989:101). Questionnaires will be interpreted and analyzed per question groupings.

1.6 Chapter Division

Chapter 1: Background and problem formulation
Chapter 2: Literature review. The chapter has been divided into 3 sections. Section 1: The emergence of modern EE, Section 2: South Africa in Transition: In search of a new curriculum and Section 3: Consensus between EE and OBE.

Chapters 3: The research design, description of the sample and methods will be discussed.

Chapter 4: Teachers' understanding and perceptions of approaches and methods in EE. It also explores their understanding and perceptions of methods and approaches used in OBE. It focuses on the synergy and application of EE methods and approaches in OBE and C2005.

Chapter 5: The research findings, proposals and recommendations, implications, suggestions for further research, conclusion and evaluation of the research.

1.7 Limitations

Limitations of this research include the following:

Time: This research was conducted under severe time pressure.

Resources: This is one of the pilot researches conducted in South African OBE in general, and EE in OBE in particular. The researcher is faced with difficulties in finding OBE and EE resources.

Finance: Conducting a research of this magnitude is very expensive and the researcher is faced with serious financial problems.

1.8 Conclusion

The focus of this study is to explore the extent of compatibility between OBE and EE in terms of approaches and methodology. It will, hopefully, be an eye opener for both policy makers and practitioners in the Education Department.

In the next chapter literature on OBE and EE approaches and methodologies will be discussed. The origins of both OBE and EE will be discussed. A closer look in-to the
methodological paradigms and approaches will be done. Further analysis will be
done on the contestations and agreements between OBE and EE. Chapter 2 will
move from international perspectives to local South African issues.


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Chapter 2
The nature and scope of EE and OBE

2.1 Introduction

The constitution of South Africa enshrines the right of every citizen to a healthy environment. This concern is reflected in the Reconstruction and Development Program (1994:40-41), which advocates that:

"... Programs should rekindle our people's love for land, to increase environmental consciousness amongst our youth, to coordinate environmental education policy at all levels, and to empower communities to act on environmental issues and to promote environmental ethic" (RDP 1994:40)

The new constitution enshrines the right of every citizen to an environment which is not detrimental to his or her health (Bill of Rights 1986). An environmental issue which risks people's lives will have to be addressed. South Africa is faced with a variety of environmental issues that arise from social-political and economic aspects of life.

Environmental issues are multifaceted and very complex; therefore, all walks of life should be engaged in attempting to solve them (Janse van Rensburg & Lotz 1998:13). Environmental education is very critical in any attempt to solve environmental problems.

The White Paper on Education and Training (1995:13) states that:

"Environmental education, involving interdisciplinary, integrated approach to learning, must be a vital element of all levels and programs of education and training system, in order to create environmentally literate and active citizens and ensure that all South Africans, present and future, enjoy a decent quality of
It would seem that the Outcomes-Based Education system has been a blessing to the
effective introduction and application of environmental education processes
especially as far as its approaches and methods are concerned.

The purpose of this research is to investigate congruence or agreement between the
approaches and methods used by OBE and those of EE (see Chapter 1.1 and 1.3). A
lot has been written about how OBE accommodates EE (Tselane and Mosidi 1998:7-8,
Lotz et-al 1998:6-10 and Janse van Rensburg & Lotz 1998 11-14). However, this
literature review will focus on the following:

- Reductionism and education
- The epistemology of a discipline-based approach
- Interdisciplinary nature of EE
- EE approaches and methodologies
- Origins and roots of OBE
- The nature and form of OBE
- Methods and approaches in OBE
- Consensus between EE and OBE methodologies and approaches

2.2. The emergence of Modern Environmental Education.

2.2.1. Reductionism and education.

Recently, much has been written about the dominant reductionistic and atomistic
curriculum framework, which operates in the Western World (Akwa 1994:11). In
the 20th century the "new" curriculum framework has influenced thoughts, actions
and perceptions of many people in other parts of the world, including South Africa,
and has been described as "reductionist - mechanistic" or "atomistic" (Gough
Reductionism sees the world as divided into separate entities, the sum of which constitutes the whole. It gives rise to a view of humans as separate from the biophysical environment which they are deemed to have control (Akwa 1994:12). The emphasis is on objectivity, individualism and rights as opposed to subjectivity and collective social responsibility (Gough 1991:562).

Though a lot has been achieved in the 20th century through the mechanistic perspective, damage has been done, particularly to the global environment. The losses have come as a result of humankind's firm and uncritical convictions to scientific approaches and knowledge as the only valid forms, to the negation of other approaches and forms of knowledge e.g. practical skills and concern for nature, the view of the universe as a mechanical system negating mysticism and divinity associated with creation (Akwa 1994:12, Leketi 1991:10). The belief in material progress to be achieved through economic and technological growth negating spirituality and failing to acknowledge limits to economic growth and development and thereby adheres to human scale technology (Gough 1991:562).

In formal education the reductionistic worldview has lead to a strong emphasis on analytical thinking; rational skills separate subjects and specialization as well as competition for domination (Harman 1985:34). These characteristics of modern education have been implicated in the global environmental despoliation (UNESCO/UNEP 1985:3).

If there are environmental problems today, it is partly because very few people have been prepared to correctly analyze and effectively solve concrete and complex problems (Akwa 1994:13). Overly abstract and overly compartmentalized education has ill-prepared people to face the changing complexity of reality (UNESA/UNEP 1985:16).

Compartmentalization of knowledge into subject disciplines which is usually
accompanied by high levels of abstraction has serious flaws that are usually overlooked (Whitehead 1967:76). Whitehead (1967:114) observed that learners, who are subjected to a compartmentalized curriculum and high levels of abstractions based on the reductionistic views, tend to lack a balance in their perceptions. He argues that such people tend to "see this set of circumstances or that set but not both sets together" (Whitehead 1976: 146).

These arguments are relevant to environmental education in the sense that environmental problems which are partly caused by compartmentalization, seem to defy solutions because of fragmented frameworks of knowledge (Capra 1983:49). Capra (1983:67) observes that it is a striking sign of our time that people who are supposed to be experts in their various fields can no longer deal with the urgent problems that have arisen in their areas of expertise.

Critics of the reductionistic-mechanistic paradigm like Capra (1983:111), Robottom (1987:54), Orr (1990:354) and Gough (1991:562), have argued that the causes of global environmental crises, of dwindling natural resources, deforestation, desertification, famine, overpopulation, pollution, the depletion of the ozone layer, threat of nuclear war toxic waste, militarization and global poverty could be attributed, in part, to the crippling inadequacies, of the reductionist - mechanistic view.

Western imperialism, colonialism, neo-colonialism and apartheid have compounded problems in Africa, in general, and South Africa in particular with regard to environmental despoliation. To explain how each of the above mentioned factors individually caused environmental degradation will be to begin a new research. However, it suffices to indicate that South Africa in particular suffers from industrial pollution (water, land, and air), deforestation, squatting, littering, poverty, segregation, economic imbalance, lack of quality education, lack of land ownership and lack of accommodation (Vulliamy 1987:17-18). South Africa has a combination of green and brown issues.
Capra (1983:100) and Orr (1990:350) provide a link between environmental problems and the reductionist perspective. They also blame humankind for failing to solve problems on the shortcomings of the dominant curriculum framework. As a result of mounting global environmental problems and humankind's inability to solve problems e.g. pollution, poverty, global warming, et cetetera, writers like Ash (1980:16), Harman (1985:34), Spretnak (1984:44) and Capra (1983:108), Robottom (1987:37) and Orr (1990:354) have called for a shift from the dominant reductionist-mechanistic world view which underpins compartmentalization, to a new world view that is characterized by an emphasis on a whole-system perspective, ecological consciousness, transmaterialism, cultural pluralism, human scale technology and solidarity with developing countries (Harman 1985:34).

2.2.2. The origins of a discipline based approach.

Philosophies that form the basis of the reductionist-mechanistic world view date back to the views of Galileo, Descartes, and Francis Bacon (Stevenson 1987:82). These philosophies are based on the assumption that there is an external reality which is independent of the subject's mind and which is knowable (Piaget et-al 1969:44, Capra 1983:92). The main contributory factors to the development of this worldview according to Stevenson (1987:73) and Capra (1983:110) have been:

- Galileo's philosophy of the separation of the intellect from values, which has been the forerunner of the analytical mind over the part of mind that is given to creativity and wholeness.
- Descartes' basis of epistemology which emphasizes the radical separation of self from object. This idea laid foundations for a compartmentalized curriculum, a separation between scientific knowledge and values as well as a believe in pure objective thought and perception uninfluenced by the biases of tradition, culture and language.
Francis Bacon's proposed union between knowledge and power, which presented science as a means of controlling and perfecting nature for human ends. This unity of power and knowledge was also experienced through new forms of scientific knowledge for the manipulation of the natural environment, but also held out the promise of building nature to serve humankind (Akwa 1994:14).

These three developments laid foundations for the emergence of the dominant reductionistic world view and curriculum paradigm that operates in many parts of the world including South Africa (Shongwe 1992:12, Akwa 1994:13). This curriculum paradigm came to be accepted without questioning. Knowledge came to be reduced, abstracted and grouped into disciplines which correspond to "the nature of the mechanistic world" (Emerly 1981:7-11, Gough 1989:569).

2.3. The interdisciplinary nature of EE

Since the beginning of the second half of the 20th century, there has been search for educational philosophies and approaches to the curriculum that would address the shortcomings of the dominant reductionist - mechanistic worldview (Capra 1983:134, Robottom 1987:37, Daly et al 1989:43, and Orr 1990:353). This has been, inter-alia, to address the global environmental problems, which threaten humankind. These problems are viewed by Capra (1983:87) as systematic problems i.e. interconnected and interdependent. He argues that environmental problems can not be solved within the fragmented approaches and methodologies characteristic of academic disciplines. Such approaches and methodologies will merely shift mankind's difficulties around in a complex web of social and ecological relations. The solution could be found if the structure of the web is changed. This will involve a profound change of our social institutions, values, philosophies and curriculum framework. Several authors agree with this proposition (Bateson 1972:33, Greig et al 1987:31, Harman 1988:324, Gough 1989:562, Orr 1990:355, and Gough 1991:564).
Harman (1985:44) describes the holistic world view as a shift in paradigm characterized by whole-system perspective ecological consciousness, feminism, transmaterialist plurality, and cultural pluralism, decentralization of power, human scale technology and solidarity with developing countries. The value system, which characterizes the New World view, seems to be captured in environmentalism and environmental education.

The various attempts in the past at educating people about the environment had taken various forms and had been referred to in various ways. For example Greig et-al (1987:39) coined the expression "educating whole people for a whole planet". Underlying this view was a perspective based on a holistic as opposed to an atomistic worldview.

Hicks (1988:17) proposed "education for peace" in reaction to the destructive use to which scientific knowledge was put. It focused on the peaceful application of science and included skills of critical thinking, cooperation, empathy, assertiveness, conflict resolution, pollution and political literacy.

Like EE, peace education did not suggest a new subject to be included in the curriculum but rather an approach to teaching, in which the teacher's role was to create a learner centered learning climate which encouraged participation, experiential learning and democracy.

Several elements could be found in the definition of environmental education and the Tblisi principles (UNESCO-UNEP 1977a: 1) that indicate the interdisciplinarity of EE.

The following have been proposed:

- Environmental education should be interdisciplinary.
Environmental education should involve problem solving.
Environmental education should impart critical thinking skills.
Environmental education should be community orientated.
Environmental education should be aimed at value and attitude change.
Environmental education should be aimed at participant involvement in the planning of learning experiences.
Environmental Education should consider the environment in its totality
Environmental education should be a life long learning process
Environmental Education should consider the current and potential environmental issues
Environmental Education should forge international cooperation
Environmental education should encourage utilization of diverse learning environments
Environmental Education should encourage problem solving skills

It is noted however that the proposed principles and approaches of EE form the basis of a debate amongst environmental educators.

2.4. EE approaches

Musonda (1982:5) endorses the Tbilisi guidelines that EE should not be a new subject. He suggested that EE does not suggest becoming a new subject but rather understanding topics that cut across all disciplines. Brennan (1991:7-9) agrees with the suggestion when he proposed that a program of education that cuts across all subjects at all levels of education should be called for, a program of education that is interdisciplinary and conceptual in nature and structure. This notion has been supported by UNESCO/UNEP (1985b:13), Fensham (1977:34), Hurry (1981:13), Martin (1982:253) and Orr (1990:352), that EE should be included in and across disciplines.

are very careful in suggesting that EE should be included in disciplines e.g.
Geography, Biology, and English. They suggest that EE should not be defined
within the narrow compartmentalized curriculum, as that will defeat the cross -
curricula intention of EE.

Various guidelines on the approaches of EE have been produced by various
international gatherings e.g. Belgrade (1975) and Tbilisi (1977)(UNESCO-UNEP
1978a:1). Amongst these was the guideline that EE should be taught across the
curriculum on an interdisciplinary basis. The international literature gives several
accounts of the interdisciplinary nature of EE and how it could be achieved in
schools. However, there is an element of confusion due to the inter-changeable use of
various concepts related to interdisciplinarity.

UNESCO - UNEP (1985:15) indicate that there is an element of ambiguity in the use
of various concepts describing the interdisciplinarity of EE. Various concepts are
used interchangeably inter- alia:

- Pluridisciplinary
- Multidisciplinary
- Transdisciplinary
- Polydisciplinary
- Juxtadisciplinary
- Holistic
- Integrated
- Cross-curricular

Gough (1991:563) in Akwa 1994:38-40 maintain that the mere inclusion of
environmental education into subject disciplines as suggested by Musonda (1982:8)
and Brennan (1991:9) is rather too simplistic and shortsighted because it fails to
take into account fundamental incompatibilities between subject disciplines and
environmental education.

Capra (1983:121) and others argue that compartmentalization is one fundamental problem in education that EE seeks to address. The philosophical underpinnings of various disciplines e.g. Geography and Chemistry still remain reductionistic and mechanistic. They are incompatible with interdisciplinarity, a whole system perspective and creation of ecological consciousness (Emerly 1981:14, Gough 1989:229-230).

In South Africa the following proposals were made towards the implementation of environmental education (Irwin 1981:12, EEPI 1983:16):

- There is a need to identify all areas within the teacher education curriculum where environmental education could be included.
- Environmental education is fundamentally cross-curricular in approach.
- While the theory and principles of environmental education could be taught as a separate entity, in practical terms it is not a separate subject but an integral part of most subjects.
- Environmental education is ideally a link between subjects and thus a key to a holistic rather than fragmented view of knowledge.
- Environmental education is not merely a conveyer of facts but an approach to teaching with emphasis on attitudes.

To achieve the necessary socio-behavioral change towards the environment in South Africa, environmental education argues for re-conceptualization of curriculum development. This reconceptualisation is derived from existentialism, phenomenology, critical theory and personal theorizing (Schubert 1986:29). It led to the development of a paradigm of critical praxis for curriculum inquiry which is captured by Irwin (1986:14). Critical praxis paradigm seeks emancipation from ideology and special attention should be given to race, socioeconomic class, gender, education, and quality of life and outlook of life (Schubert 1986:30). This revolution
will lead to an environmental ethic that is proposed by Fien (1993:5):

"... What is needed is the transformation of people's attitudes and practices ... people's behavior are a matter of choice based upon values..."

(Fien 1993:5)

Notwithstanding the arguments presented above, some of the criteria to consider in curriculum theorizing will be alluded to.

The critical praxis paradigm maintains that the following should be the criteria for consideration in any curriculum theorizing in an attempt to include Environmental Education (Schubert 1986:48):

- Organic view of nature: nature is reviewed as an interdependent, dynamic holistic ecological unit.
- Individuals as the creators of knowledge and culture: Individual human beings should not be seen as receivers of knowledge through an educative process.
- Experiential base of method: one should be aware of one's autobiography in the restitution
- Precious experience: behavior emanating out of experience is or should be highly regarded.
- New sources of literature for curriculum development: consideration of existentialism, phenomenology, radical psychoanalysis, critical theory and poetry, film, stories theatre, (etc).
- Liberty and high levels of consciousness, people should be more perspectival, they should be wide-awake and emancipated.
- Means and ends that include diversity and pluralism: means and ends are not opposites, nor cause and effect, they should be an integral part of a process of political and social reconceptualisation.
- New language forms: Language that one uses has a lot of influence on communication and the way in which we view life. Languages of moral
compassion and sensitive aesthetic imagination are needed.

Fien (1993:5) argues that to achieve education for the environment students should be engaged in:

"... The intellectual task of critical appraisal of environmental situations and the formulation of a moral code concerning such issues..." (Fien 1993:5)

To achieve this, the curriculum should include the following criteria or elements:

- Reject positivist notion of rationality, objectivity and truth in favor of a dialectical
- Be grounded in the experiences of teachers and other participants in the educational process
- Distinguish distorted ideological interpretations in teacher's understanding of their experiences.
- Identify aspects of the existing social order that frustrate the attainment of critical educational goals.
- Integrate theory and practice by providing a language and strategies for action to address the false consciousness and obstructions to critical pedagogy.
- Learners and educators should be able to self-critique.

Brooks (1973:8-9), Ramsey and Hungerford (1992:37) argue that radical environmentalism is necessary to achieve socio-behavioural transformations aspired by critical praxis and education for the environment. The roots of the existing society should be severed.

Radical environmentalism attempts to introduce the following criteria in the curriculum (Tyldesky 1990:25-28):

- Criticize conventional wisdom
- Explore the material and ideological basis of conventional wisdom
open student's minds to alternative worldviews
work and live cooperatively
realize that humans can act collectively to shape society

Carl (1995:95) alludes to general criteria which EE should also take note of:

- The interdisciplinary nature of curriculum design must be acknowledged
- There must be child directedness, which takes the child's level of development into account.
- Planning must be purposeful.
- Practical methods must be a critical component.
- There must be tolerance with regards to practice orientation and need.
- Comprehensiveness must be a characteristic of the design.
- Didactic demands must be taken into consideration.

The review of the philosophical and methodological arguments of EE brings this section to its logical conclusion. In the following section the South African curriculum dispensation that is defined by OBE and translated into C2005 will be investigated.

2.5 Origins and roots of OBE: An international overview

The roots of OBE could be traced to a variety of sources. Schwarz (1994:334) and McAshan (1979:112) trace the roots of OBE in competency-based education (CBE) and mastery learning. Grant (1979:79) and Evans and King (1991:13) argue that the origins of OBE is more from CBE than mastery learning.

The researcher feels that it would be necessary to give an overview of competency and mastery education before discussing OBE itself.

Competency education has its roots in the 1960's (Schwarz, 1994:330). This is
defined as an education system that organizes and evaluates instruction. McAshan (1979) argues that in its purest form CBE was aimed at overcoming perennial problems that have plagued experience-based programs or traditional education. It hopes to improve learning by improving the quality of instruction in all schools. It is a system in which the desired outcomes, usually referred to as competencies which represent the specific instructional intents and the behavioral outcomes, sometimes referred to as assessment modes or evaluation indicators are specified in advance in a written form (Mc Ashan 1979:79 and Grant 1979:100).

Characteristics of CBE therefore include:

- Selection of competencies
- Specification of appropriate evaluation indicators
- Development of functional instructional delivery system

(Grant, 1979:110)

CBE was a great departure from the traditional experiential education to the behavioral objective era. To some extent CBE hopes to alleviate duplication of content in traditional education, to establish and maintain consistency of competencies taught within courses regardless of the instructor teaching course, improve individualization of instruction, refine accreditation practices, revise and implement appropriate systems of evaluation and reporting of student achievement, to better communicate with learners about outcomes they are supposed to achieve and how success will be determined, to better provide students with ongoing information regarding their personal progress, to be able to be accountable to public and finally to improve student achievement of desired competencies (Grant 1979:79). Grant (1979:99) argues that CBE is like teaching while thinking about the end. Without getting into details, competency education has the following effects:

- CBE redefines the role of the teacher. The teacher has to be a researcher, curriculum developer, determine outcomes, certify, advises, design the learning programs and facilitate knowledge.
CBE removes the autocratic power of the educator; the learner and the educator have to share power.

CBE forces teachers to rethink what they teach.

CBE calls for reflection.

CBE makes teachers feel more exposed. Teachers have to submit their teaching to external review of some sort.

CBE invites separation of the teacher from what is taught and invites collaborative relationship between teacher and student.

CBE invites collaboration among teachers, encourages learners to take responsibility of their own learning and also invites individualization of learning.

Brady(1996:9-12), Baron(1996:575) and Schwarz(1994:334-336) agree with Blank (1982:114) that the principles of CBE have a close resemblance to the principles of OBE. Some of these principles are the following:

- All learners could master any task if provided with high quality learning experience and time.
- Learner ability should not necessarily predict how well the learner learns the task.
- Difference in the level of mastery of tasks amongst students is often due to errors in the learning environment and not characteristics of learners.
- Focus should be more on the differences in learning and less on differences in learners.
- What is worth teaching is worth learning.
- Learners take ownership of their own learning.

OBE also has its roots in mastery learning which is an approach to individualized instruction in which learners are allowed the time necessary to master units of curricula before moving to the next learning unit (Schwarz 1994:326).

When properly designed CBE and mastery learning could be very valuable and

OBE has been defined differently by different authors:

"OBE is an educational philosophy organized around several basic beliefs and principles. It starts with the belief that all students can learn and succeed ... organized from a focus on student exit outcomes and designed downward to the subject and unit levels, it focuses on instructional strategies on clearly defined learner outcomes getting high standards with high expectations for all students and includes expanded opportunities for enrichment and remediation" (Schwarz 1994: 327-328)

"OBE means organizing for results: basing what we do instructionally on the outcomes we want to achieve ... outcome-based practitioners start by determining the knowledge, competencies, and qualities they want students to be able to demonstrate when they finish school and face the challenges and opportunities of the adult world ... OBE therefore is not a "program" but a way of designing, delivering and documenting instruction in terms of its intended goals and outcomes" (Spady 1988:5 in Mc Kernan 1993:344)

"OBE means clearly focusing and organizing everything in an educational system around what is essential for all learners to be able to do successfully at the end of their learning experiences. This means starting with a clear picture of what is important for students to be able to do, then organizing curriculum, instruction and assessment to make sure that this learning ultimately happens (Spady 1994 in report of Review committee on C2005: 9).

"... In essence OBE is defining, organizing, focusing and directing all aspects of a teaching system in relation to what we want all learners to demonstrate successfully when they exit the system...."
Clearly there are numerous areas of commonality in the definitions given above, *inter-alia*:

- Develop clearly defined outcomes that all learners must demonstrate
- Define teaching and learning that ensures the demonstration of these outcomes
- Monitor individual student progress on the basis of demonstrated performance
- Utilize criterion referenced assessment both to monitor progress and to group students.
- Provide remediation for students who do not achieve the outcomes quickly and enrichment for those who do.

In the next section OBE in South Africa will be discussed. South Africa embraced OBE as an education policy. The aim was to improve the quality of life for all and address the concerns of a variety of education groups including EE pressure groups that called for a change in the learning and teaching approaches in order to improve the quality of the environment.

### 2.5.1 South Africa in transition: in search of a new curriculum

The 1994 general elections heralded a new dispensation in many spheres of life in South Africa. The need for educational transformation was at the heart of the new National Government. Central to educational transformation is curriculum change. Embraced in curriculum change is a paradigm shift and change (DOE 1997:6). This paradigm shift recognized a change in the way people think about learning, organization in education and training.

The previous scenario in South African education was that, education was subjected to time constraints, political intolerance, racial discrimination, and unbalanced economics and it was not focused to educate the nation. Education did not have a
social function and environmental determinism (DOE 1997:7).

The vision of the new government was to change education in order to address previous disparities in education (DOE 1997:7 and ANC 1996:25). The vision was further to develop a country that is truly united and democratic. Education has to be relevant, of high quality and accessible to all learners irrespective of race, colour, gender, age, religion ability or language (ANC 1996:25-30).

After the 1994 general elections the new dispensation entered into consultative meetings with officials of the Netherlands, Australia and Canada to assist in the recasting of education in South Africa (DOE 1997:12).

C2005 is a product of the integration between education and training through the National Qualification Framework (NQF). The theory and practice of the NQF is directed towards assessment, qualification and competency framework. This model drew from a variety of curriculum ideas to fit the local conditions. OBE was included amongst the ideas (Chisholm 2000: 2). C2005 was implemented within a political, social, and a variety of other contexts. A process of indigenization through policy formulation had to occur (Chisholm 2000:2)

Several moments could be noted in the process of the introduction of OBE in general and C2005 in particular (Chisholm 2000:2-5):

- Following the 1994 elections the National Education and Training Forum was formed for subject rationalization and syllabus revision.
- Following the elections in 1994, the National Qualification Framework was formed and it gave birth to South African Qualifications Authority in 1995 and it became operational in 1996.
- The National Curriculum Development Committee (1995) and the Curriculum

- 1996: Council of Education Ministers approved the new curriculum framework.
- 1996: Operationalisation of the new curriculum process in the GET Phase
- 1997: Training of trainers and preparation of materials and documents for illustrative learning programs.
- Implementation in 1998.

When the minister of Education announced the introduction of the new OBE curriculum in 1995, implementation was scheduled for all grades (1-12) by the year 2000. In 1997 the timetable was revised to 2005 and in line with this, the new curriculum became known as Curriculum 2005. This was again revised in 2000 and a new curriculum statement was issued in 2001 (Chisholm 2001:5).

The main differences between C2005 and Curriculum 21 could be summed as follows (Coetzer, 2001: 79-81):

<table>
<thead>
<tr>
<th>Curriculum 21</th>
<th>Curriculum 2005</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>In</strong></td>
<td><strong>Out</strong></td>
</tr>
<tr>
<td>A streamlined, revised Curriculum 21</td>
<td>Curriculum 2005 and its current form</td>
</tr>
<tr>
<td>A new curriculum statement clearly explain what is to be learned and at what level it is to be tested</td>
<td>Existing policy documents on C2005</td>
</tr>
<tr>
<td>Plain English</td>
<td>Complex jargon</td>
</tr>
<tr>
<td>Six learning areas for Grades 4 to 9: language, mathematics, natural sciences, social sciences, arts and culture and life orientation</td>
<td>Eight learning areas</td>
</tr>
<tr>
<td>History and geography previously</td>
<td>Technology and economic and</td>
</tr>
<tr>
<td><strong>neglected, will be reinstated as a key part of the social sciences</strong></td>
<td><strong>management sciences are to be dropped for now in view of the current shortage of teachers and other resources</strong></td>
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<tr>
<td><strong>There will be a strong focus on the teaching of science and math with 70% of classroom time to be spent on math and language teaching in Grades 1 to 3, and 50% from Grade 4 onwards</strong></td>
<td><strong>The myth that reading and maths should not be specifically taught</strong></td>
</tr>
<tr>
<td><strong>There are learning area statements that pin down what a pupil should know and be able to do in each of the six learning areas</strong></td>
<td><strong>The 66 specific outcomes against which learners had to be tested in each grade</strong></td>
</tr>
<tr>
<td><strong>Learning outcomes and targets will explain what concepts, content and skills pupils should learn in each of the six learning programmes in each grade</strong></td>
<td><strong>Assessment criteria, range statements, performance indicators, expected levels of performance and phase organizers</strong></td>
</tr>
<tr>
<td><strong>Assessment standards will describe in detail what a pupil should be able to do and know in each grade.</strong></td>
<td><strong>Programme organizers or themes, for example transport, included by teachers under language and math, lead to boredom among pupils</strong></td>
</tr>
<tr>
<td><strong>There will be a reasonable time-frame</strong></td>
<td><strong>Rushed implementation</strong></td>
</tr>
<tr>
<td><strong>Teachers will be trained in the selection and use of the textbooks</strong></td>
<td><strong>Macro-planning - the practice whereby schools choose the same topics to teach different learning areas</strong></td>
</tr>
<tr>
<td><strong>Flexibility and teacher discretion will be allowed in the classroom</strong></td>
<td><strong>Group work as the only learning method</strong></td>
</tr>
<tr>
<td><strong>There will be grade-by-grade benchmarks or targets</strong></td>
<td><strong>Evaluation by phase, for example testing a pupil at the end of Grade 3 rather than each year from Grades 1 to 3</strong></td>
</tr>
<tr>
<td><strong>Curriculum 21 will be introduced in the intermediate and the foundation phase</strong></td>
<td><strong>A General Education and Training Certificate in 2002</strong></td>
</tr>
</tbody>
</table>
when appropriate and will be done by phase (Grade 1 to 3 and Grades 4 to 6) and in the senior phase by each grade

Subject to negotiation, as from 2006 a General Education and Training Certificate will be awarded to pupils when they complete Grade 9

2.5.2 Methodological approaches of OBE in South Africa.

"Our education system needs a new theoretical and operating paradigm ... the new paradigm must be success-based in philosophy and outcomes-based in practice."


OBE as a theoretical paradigm and a philosophy, has received support and popularity in various countries e.g. America, Australia and Canada (Boschee 1994:195, Glatthorn 1993:359 and Zitterkopf 1994:177). This movement has been refined and popularized by Spady (Glatthorn 1993:358, Baron 1994:575 and Evans 1991:13). Tyler (in Glatthorn 1993:360) designed the basic building blocks of OBE 40 years ago.

The proponents of OBE argue that it has "something for every one" (Furman 1994). It is argued to be a means of producing educational success for all students through curriculum and assessment alignment and an unrelenting focus on student outcomes. It also gained pedagogical power and popularity as it responded to accountability climate in education. It had "something" for educators and politicians (Furman 1994:21).

- What a student is to learn is clearly identified and outcomes are:
  - Future-oriented
  - Publicity defined,
  - Learner-centered,
  - Focused on life skills and context,
  - Characterized by high expectations of and for all learners; and
  - Sources from which all other educational decisions flow.

Learning is:

- Facilitated carefully towards achievement of the outcomes.
- Characterized by its appropriateness to each learner's needs, interests, and developmental level.
- Active and experience-based for maximum application of the knowledge.

OBE also includes the following:

- Skills and orientations necessary to learner success in the present and future.
- Each student's progress is based on his or her demonstrated achievement.
- Emphasis is on achievement of outcomes and application of learning, rather than "covering" material.
- Assessment of learning is appropriate to the learning, its life context, and the
learner.

➢ Advancement is based on achievement of outcomes, rather than on seat time or comparative data.

➢ Progress is demonstrated and recorded based on criterion-referenced, rather than norm-referenced, assessment.

➢ Learners advance because they demonstrate accomplishment of significant skills for independence and future success.

➢ Each student's needs are accommodated through multiple instructional strategies and assessment tools. Instructional decisions are based on each learner's needs, desires, and readiness for achieving outcomes.

Instructional design for each learner is an ongoing process of reflection and analysis that is focused on meeting the learner's needs. Teachers facilitate the learning process and coach learners based on the best theory, research, and analysis.

Assessment is effectively used to practice and substantiate learning and to provide data for further learning decisions. Learners become progressively more able to design their own learning options and assessments. Evaluation is also clarified by outcomes. It sets clear targets for assessment. It also makes assessment easier (Brady 1996:14).

Each student is allotted time and assistance to realize his or her potential. All learners work to become more responsible for their own learning; able to make appropriate learning decisions; independent in learning and thinking; self-assessing and successful.

Time is viewed and applied as a variable, while learning is a constant. Time is managed wisely by the learner and the school to achieve ever-increasing levels of accomplishment. Assistance is sought from every available resource for providing significant learning opportunities.
Brady (1996:12) and Glatthorn (1993:361) provide a detailed analogy of the benefits that come with OBE to knowledge and curriculum reform. Getting outcomes help teachers to crystallize their intentions by imposing the need to make vague ideas explicit. Clarity in measuring achievement could best be defined by outcomes. Inherent in the setting of outcomes is a clear guideline for planning learning experiences and programs by educators.

Clear outcomes facilitate the selection of content, method, resources and organizational procedures. They set clear indicators of what is to be achieved therefore planning becomes easy.

Furman (1994:22) argues that OBE eliminates permanent failure in that students who do not achieve outcomes receive appropriate remediation. He also argues that a compromise of standards will be eliminated. Brady (1996:12) and Furman (1994:23) agree that OBE assists in the operation of accountability. Furman (1994:42) alludes to various types of accountabilities:

- Political accountability
- Legal accountability
- Bureaucratic accountability
- Professional accountability
- Market accountability

Of these accountabilities, bureaucratic and professional accountabilities are most relevant to OBE. Bureaucratically, teachers are held accountable for the rules and regulations promulgated by policy makers at national level. This accountability assumes that policy makers are able to make or determine best practices for schools. Professional accountability alludes to the fact that teachers are accountable first to their profession and standards. This relies on professional judgement, quality in teaching, decision-making and proper mentoring and support of educators.
Internationally OBE evolved into three (3) distinct models. (Brady 1996:12 and Blunden 1995:17):

- Traditional OBE
- Transitional OBE
- Transformational OBE

The researcher will be tempted to discuss in details only the transformational OBE as it relates to South Africa.

Transformational OBE is a collaborative, flexible, transdisciplinary, outcomes based, open system and empowerment – an oriented approach to teaching and learning. It aims at equipping learners with the knowledge, competence and orientation that is needed after they have left school. Its vision is the production of competent and thinking future citizens. Learners should be able to translate knowledge to reality, challenging and transforming society (Doe 1997:12).

Critical to transformational OBE in South Africa are its characteristics. It calls for integration of concepts in a cross curricula approach which embraces not only the structure of the curriculum, but also the methods by which instruction is given. Learners should be put first. Education should recognize and build on their knowledge and experiences and respond to their needs. Learner centeredness is an important principle to the approach and gives considerable emphasis on the constructivist approach to learning. Co-operative learning is also critical and progress should be demonstrated through integrated tasks and application of skills to real world problems.

It remains the responsibility of the educator to develop meaningful learning experiences that lead to the mastery of the outcomes. Learners do not fail but progress at different phases and rates towards achievement of outcomes (Doe 1997:14, Brady 1996:13 and report of the review committee on C2005 2000:21)
This new dispensation had a drastic effect on the learner and the educator equally. Boschee (1994:194) and Baron (1993:575) argue that the learners will be provided with time and support to realize their potential. However, the learners will be responsible for their decisions, responsible thinking, learning and assessment. Time will be viewed as a variable and learning as a constant. Assistance will be given to maximize learning and to meet the needs of the learners. Learners should be given opportunities to make decisions, solve problems, teach others, create products, critique, defend and predict (Boschee 1993:195).

Following a great deal of debates and consultations, SAQA and NQF produced the Curriculum Framework and the critical outcomes. (See appendix C: The structure of the NQF.)

Critical outcomes are broad, generic cross-curricula outcomes, which underpin the constitution and are adapted by SAQA.

These outcomes

"...will ensure that learners gain the skills, knowledge and values that will allow them to contribute to the success of the family, community and the nation ..." (DOE 1993:4).

These critical outcomes ensure that learners will
- identify and solve problems in which responses display that responsible decisions using critical and creative thinking have been made.
- work effectively with others as members of a group, team, organization and community.
- organize and manage oneself and one's activities responsibly and effectively.
- collect, analyze, organize and critically evaluate information.
communicate effectively using visual, mathematical and or language skills in the modes of oral and or written presentations

use science and technology effectively and critically, showing responsibility towards the environment and health of others.

demonstrate an understanding of the world as a set of related systems by recognizing that problem-solving contexts do not exist in isolation.

In order to contribute to the full person programs should

- reflect on and explore a variety of strategies for learning more effectively
- participate as a responsible citizen in the life of local, national and global communities.
- be culturally and aesthetically sensitive across a range of social contexts
- develop entrepreneurial skills.
- explore education and career opportunities.

(DoE senior phase policy document: 12-13)

The council of Education Ministers also identified 8(eight) learning areas:

- Language, Literacy and Communication
- Mathematical Literacy, Mathematics and Mathematical sciences
- Human and Social Sciences
- Natural Sciences
- Technology
- Arts and Culture
- Economics and Management Sciences
- Life Orientation

Each learning area has a learning area outcome and specific outcomes (DoE 1993, DoE policy document 1997) These specific outcomes are listed in the Department of Education policy documents for Foundation, Intermediate and senior Phases.
OBE represents a complete departure from the traditional methods of teaching and learning. Critical to the approach of OBE are the phase organizers. Five (5) phase organizers have been agreed upon (DoE 1997:5)

- Learner as the communicator
- Learner as the Enquirer
- Learner as active creative participant
- The learner in the environment and
- Learner and personal development

The phase organizers provide the context and focus through which specific outcomes can be achieved at all levels and phases within the general education and training band. The phase organizers enable the education process to support learning in different learning areas Lotz, et al (1998:12). Phase organizers also facilitate the cross-curricula nature of OBE. Knowledge should not be discipline specific; it should cut across all areas of learning. Phase organizers assist with the portability of the curriculum. They allow learners to move interprovincially.

These phase organizers exist in all eight learning areas and can be seen as a reflection of the critical outcomes. Broadly phase organizers represent interests of value in the present South Africa. They also play a vital role in learning support material development for learners and facilitators support material development.

Through the use of learning areas, critical outcomes, specific outcomes, range statements and assessment criteria, learning programs will be produced. Learning programs will help learners and educators to meet the nationally agreed outcomes Lotz, et al (1998:15). They might even include specific learning contents, learning experiences, support materials and advises on teaching approaches.

The most accepted definition of a learning program is:
"A learning program consists of courses or units of learning (learning materials combined with a methodology) by which learners can achieve agreed upon learning outcomes." (Curriculum 2005 - Lifelong learning for the 21st century:10).

The main focus is to provide learners with learning experiences. Learning experience refers to various things that learners will come into contact with during their education (Doe 1993:3).

With the outcomes clearly in mind, educators will develop or design learning programs with the intention that all learners will be able to demonstrate them successfully. This is often referred to as a "design down" (Lotz 1998:10-11). Learning experiences and learning programs are designed from the already predetermined specific outcomes.

The grid system is used in South African OBE. The grid is a cluster of possible specific outcomes and assessment criteria from each learning area that has relevance to the learning program and these organizers (Tselane and Mosidi 1998:8). Grids are supposed to be developed per learning program. The function of the grid is to facilitate planning and development of learning activities for the learning program. It also provides for the development of learner and teacher support materials. The value of a grid is that it allows one to see how integration with other learning programs becomes possible. It could be used as reference to identify the outcomes that learners are to achieve. Portability of the curriculum becomes possible. It could also be used for recording and reporting in assessment (Doe 1997:30-31).

The grid system is the most radical departure in OBE- particularly in South Africa. It does not only call for integration of knowledge across disciplines into learning areas but also integration of knowledge across learning areas. The outcome of this form of integration will be a profound transferability of knowledge in real life
This research will be incomplete without the researcher alluding to various factors to be considered in the development of learning programs. The following are brief points to be considered in the production of a learning program:

- Understand what the learning program is about
- Understand the phase organizer
- Choose a program organizer that relates to your phase organizer
- The program organizer should be drawn from the learner's surroundings
- Choose specific outcomes that relate to the program and phase organizer
- One SO is used in more than one L.P. And some SO's are not possible in other LA's
- Do not confine the choosing of SOs only to one learning area
- Work out activity outcomes to break down specific outcomes into manageable parts and also make assessment easier

(Mosidi and Tselane 1998:12)

Mosidi and Tselane (1998:12) also referred to various methods that could be used in designing learning experiences. Some of them are:

Drama
Games
Pictures
Group work
Self-discovery

Stories
Discussions
Practical imitations
Hands-on
Miming etc.

(Mosidi and Tselane 1998:12)

Several ideas could be used in the development of activities in various learning programs e.g.: Littering
Literacy
- Listening
- Speaking
- Reading
- Writing
- Drama
- Mime
- Singing
- Vocabulary
- Advertisements

Numeracy
- Counting
- Checking
- Measuring
- Valuing
- Calculating

Life Skills
- Entrepreneurship
- Sorting and Classification
- Comparison
- Art
- Responsibility taking
- Solutionising
The other critical area in South African OBE is a strong element of constructivism. The transformational OBE in South Africa is strongly learner centered therefore constructivist in nature. Each learner constructs own meaning and learns about issues, problems and topics (Brooks and Brooks 1998:39, Janse van Rensburg 1998:7). Also see Chapter 1, section 1.4.

Learners have different experiences, understandings and their own interpretations. Constructivism is also a break away from traditional teaching. It helps learners to internalize, reshape and transform new knowledge. Transformation occurs through the creation of new understandings that lead to the creation of new cognitive structures (Marlowe 1998:53-60). She continues to argue that it is through questioning, investigation, problem generation and problem solving that learning is promoted rather than being transmitted. Application, critical thinking and analysis are critical to constructivism and OBE in general.

Brooks and Brooks (1993:64) and Marlowe (1998:57) suggest the following guiding principles for producing a constructivist class:

- Posing problems of relevance to the learner.
- Structuring problems around primary concepts. This involves holistic presentation of problems and ideas not separate and isolated.
- Seeking and valuing learner's point of view. Learner's points of views filter their perceptions and understandings.
- Curriculum should match the level of the learner. Mismatch between cognitive demands of class and real life should be avoided.
- Assess the learner's learning within the context of teaching.
- Focus should be on positive thinking and motivation not assessment for condemnation.

The constructivist vista, however, is far more panoramic and therefore illusive. Deep understanding is the goal. "This is a paradoxical enterprise" (Brooks and
Brooks 1993:57). Constructivism provides an ideal instructional environment, it creates hope of independence not only to the learner but also to the teacher but it is very difficult to achieve the dream.

2.5.3 Consensus between OBE and Environmental Education

This section draws on the approaches of EE and OBE as discussed earlier (2.3, 2.4 and 2.5) in this study sections of the research. It represents the core of this study. EE has evolved over a number of years. In that evolution it emerged with distinct a philosophy and methodologies. EE challenged the conventional educational approaches to teaching and learning.

Sections 2.2 and 2.3 focus on the nature and philosophy of EE whilst sections 2.5.1 and 2.5.2 are grounded on the nature and roots of OBE. OBE has evolved throughout the world especially in Europe and America as a response to the questions and challenges that were leveled against the 20th century education. Parents and educationists challenged the relevance and value of the system. OBE emerging out of the surrogates of CBE and mastery learning brought out “answers” to the challenges. OBE did not have any direct link nor did it emerge with EE aspirations at its heart.

EE on the other hand challenged the approaches of the 20th century compartmentalized education system. Most of the issues or challenges raised by OBE are similar to those of EE (2.2 and 2.5.1). Even though EE and OBE emerged at different times they are both triggered by the same "enemy" i.e. the 20th century reductionistic and mechanistic education which has lost relevance and value. The coming of OBE in South Africa was thus welcomed by EE with the hope of correcting the evils of the old system.

Section 2.2 refers to the origins of OBE in South Africa and the launching of Curriculum 2005 by the Minister of Education in March 1997 marked a significant change in the history of South African education (Tselane and Mosidi 1998:5-7).
Most importantly it marked victory for EE. The long struggle that started in the 1970's is drawing to a close (Van Rensburg and Lotz 1998:4).

Sections 2.4 and 2.5 focused specifically on the approaches and methodologies of EE and OBE respectively. EE methodologies call for integration of knowledge; holism; cross-curricular, interdisciplinary approaches. It rejects atomistic, mechanistic, positivistic, discipline based, technocratic and egocentric educational approaches and methodologies (2.4). OBE shares similar methodological paradigms with EE (2.5.3).

OBE and EE share a lot of similarities in approaches to learning and teaching. The aims, objectives and outcomes of EE (2.3) and the outcomes of OBE in South Africa are compatible. The outcomes of both EE and OBE ensure that learners will

- identify and solve problems in which responses display that responsible decisions using critical and creative thinking have been made.
- work effectively with others as members of a group, team, organization and community.
- organize and manage oneself and one's activities responsibly and effectively.
- collect, analyze, organize and critically evaluate information.
- communicate effectively using visual, mathematical and or language skills in the modes of oral and or written presentations.
- use science and technology effectively and critically, showing responsibility towards the environment and health of others.
- demonstrate an understanding of the world as a set of related systems by recognizing that problem-solving contexts do not exist in isolation.

The design of environmental education activities or learning experiences has inherently, an objective of achieving predetermined outcomes. Monitoring students on the basis of demonstrated performance, use of criterion referenced assessment, and providing individual support and mentoring are all critical components of environmental education (See Chapter 2.3:21-17) and OBE (See Chapter 3.2:34-40).
Integration of knowledge, systems approach, and ecocentric view are not new concepts in environmental education.

OBE does not reject the premise that for effective curriculum reconceptualisation to occur: existentialism, critical praxis, phenomenology, critical theory and personal theorizing have to be applied. This notion has been noted in section 2.4 and 2.5.3. OBE agrees with EE curriculum theories that acknowledge

- Child centeredness
- Interdisciplinary and cross-curricula nature of knowledge
- Purposefulness of planning
- Relevance to practice
- Comprehensiveness
- Acknowledgement of dialectical demands
- Constant evaluation of curriculum
- The balancing of all domains

EE also agrees with OBE on the integration of knowledge and constructivism as a process of learning (Ballantine and Packer 1996:28). EE argues that in constructive learning and teaching, learning does not necessarily have to conflict with existing conceptions, instead it extends and elaborates the existing belief system. There is no need for a radical incongruent transformation or replacement of concepts. We need to build on the existing frame work and develop further (Tennyson and Youngers 1993:281). Environmental education focuses on conceptions and misconceptions. It exposes students to alternative conceptions and confronts them with new information designed to challenge inaccurate conceptions (Ballantine and Packer 1996:30).

With regard to instructional methods EE and OBE encourages implementation of a variety of methods (Neal and Palmer 1990:67). There is no perfect method for all-possible education and instructive outcomes. Success will be achieved when a variety of methods are combined (Neal and Palmer 1990:109).
The nature of EE and OBE encourage hands on approach to teaching and learning. They encourage experiential learning - outdoor and practical student centered learning. Learners should be able to touch, smell and manipulate learning material. As a result; section 2.2 highlighted various methods that could be used in EE and OBE. Broadly they include the following:

- Discovery method
- Adventure method
- Communication method
- Understanding method
- Creativity method
- Fantasy method
- Valuing method
- Narrative method
- Self activity method
- Project method
- Games and Simulations

Harman (1985:67) attaches a lot of value to these methods, inter-alia, they are exploratory, enjoyable, involving, interdisciplinary, participatory, problem directed, practical, and encourages decision making, improves performance, involves values, involves a variety of skills and application of knowledge.

In South Africa EE and OBE are harmoniously married even though there are problems in every marriage. Dissolution of subject disciplines and the creation of learning areas are a great success for EE.

Critical outcomes were also developed which attempted to cut across the learning areas. The intention was to define the outcomes of education in a coherent manner. Critical outcomes are supported by pedagogically specific outcomes, as indicated in section 2. A closer look of specific outcomes indicate that most learning area outcomes have specific environmental significance. This indicates accommodation of EE within OBE. (See appendix D: 'Environmental' specific outcomes in C2005.)
Furthermore, the environment has been included as a phase organizer in C2005. It is a further proof that EE agrees with OBE in terms of knowledge integration (Lotz, et al., 1998:15). The environment as a phase organizer provides context and focus through which specific outcomes could be achieved at all levels and phases within GET. This enables environmental education processes to support learning in different learning areas (Lotz et al. 1998:15 and Tselane and Mosidi 1998:7). The recognition of environmental concerns within the critical outcomes has been recognized by the White Paper on Education and Training (1995:18):

"Environmental education, involving an interdisciplinary, integrated and active approach to learning, must be a vital element of all levels and programs of an education and training system..."

This is also reflected in the RDP document (RDP 1996:109), White Paper on Environmental Management (1997:10) and Environmental Education Discussion Document (1998:9). It also supports the Bill of Rights (1996:23) which endorses that all citizens have a right to a healthy environment (in Lotz et al. 1998:11).

The researcher can, therefore, confidently conclude that despite inevitable differences between OBE and EE, OBE allows for environmental methodologies and approaches. It also allows for environmental education processes.

"We ought not to be overanxious to encourage innovation, in cases of doubtful improvement, for an old system must ever have two advantages over a new one; it is established and understood."

(Cotton in Mc Ashan 1979:3)

"People act not according to the truth but according to what they think to be the truth. Control what people think and you will control the way they act."

(Marx in McAshan 1979:3)
2.6 Conclusion

Chapter two has presented a literature review for this study. The review is very crucial to the study. It provides background information on EE and OBE. The first section of this chapter attempted to give an overview of EE and its origins, approaches and methodologies. It also focuses on the evolution of OBE in South Africa. The philosophical background has also been given.

The chapter is concluded by a critical focus on the synergy between OBE and EE. It looks at the methodological and approach congruence. The readings propose that there is a lot in common between OBE and EE. It is the object of this study to verify or reject the idea.

Chapter 3 will look at the research sample, data collection and the analysis processes. The results of the investigation on the educators' perceptions and understanding of EE and OBE approaches and methodologies will be discussed in Chapter 4.
Chapter 3

Sample description and methodology of research process.

3.1 Introduction

The focus of Chapter 3 is on the educators' understanding and perceptions of OBE and EE. The methodology that is going to be used in this study will be looked into. The research sample will also be discussed.

Various aspects related to the sample have been alluded to e.g. training in OBE, training in EE, teaching experience, qualifications and the level of development around the school. These factors have tremendous significance on the quality of the research sample.

3.2 The phenomenological paradigm

The definition and selection of the problem for inquiry are determined by paradigms (Cohen and Manion 1980:10-27). The positivist paradigm and the phenomenological paradigms have been referred to in Chapter 1.6. For this research or study the phenomenological paradigm has been chosen. The choice of the paradigm is based on the fact that it emphasizes holism and qualitative information analysis instead of explanation and prediction (Hussen 1998:203).

The basis of the phenomenological paradigm is that human activities cannot be reduced to mathematical abstractions and laws. Theorizing is not mind independent and not theory dependant (Cohen and Manion 1994:22). Individuality of persons, complexities of situations and uniqueness of events should be acknowledged (Walker and Evers 1988:67).

The phenomenological paradigm has also been chosen because it allows the researcher to go beyond the obvious and explain deeply the complexities of human activities. It allows the inner understanding. The phenomenological approach is well-grounded, rich in explanation and description (Rist 1979:447). The researcher
would also like to study EE in action and this does not allow generalizations. One hopes to understand relationships in an educational setting rather than generalizing and predicting them.

3.3 Research sample

The sample chosen for this study comprises of 87 educators practicing in the primary schools in the Rustenburg District. These educators are exposed to both EE and OBE and they are constantly under OBE and EE training. To the researcher they are in a position to reject or accept the congruence in methodology between EE and OBE.

The 87 teachers represent 10% of the 10 primary schools selected out of 100 primary schools in the Rustenburg District (There are actually 100 Primary Schools in the Rustenburg District, see Appendix B). The names of the Schools are Bothibello, Borite, Tumagole, Monakato, Mogono, Lekwakwa, Tlaseng, Letsibogo, Zinniaville and Thusanong Combined Farm School (See Appendix D: Distribution of schools). The schools have been selected after several factors were considered: geographic location, urban or rural, private or government, mainstream or farm school and diversity of school population.

The teachers have been drawn from a large pool of teachers who have been either trained by the Department of Education: Subject Advisory or Tlhabane College of Education. Tlhabane College of Education has established the curriculum support unit, which has been highly, trained on OBE and other curriculum issues. The training of teachers by Tlhabane College of Education is on-going and a lot has been achieved (See Appendix E: Reports on various work-shops conducted). The conclusion of the researcher is that these teachers are competent enough to participate fruitfully in this research. Their inputs as practitioners are very crucial.
It was very significant for the researcher to carefully select respondents as their inputs are very important. Figure 1 indicates that most educators have received training in OBE. They have been work-shopped on OBE (see appendix E). Figure 2 indicates that not all respondents have had training in EE; however, 56% of the respondents have had the training.

Before the questionnaires were administered to the schools they were pre-tested. 10 teachers were randomly selected from the identified sample. The questionnaires were pre-tested for a variety of reasons, amongst others:

- To check on the clarity of the questions
- To check on the relevance of questions
➢ To locate interpretation problems
➢ To verify analysis of results

The trial run or pretest indicated that a few questions had to be adjusted in terms of language. Grouping and numbering of questionnaires also had to be adjusted. This was very crucial and important for this study. If this was not done a lot of mistakes were going to be encountered.

Of the 87 questionnaires sent to sample schools, only 73 were returned. Various excuses and apologies were forwarded to the researcher via the Principals for the 14 questionnaires, which were not returned. The return percentage of 84, is by, this research standard, good.

However, despite the high return rate, the researcher had to revisit several respondents who did not complete the entire questionnaire. Some of the respondents could not be reached as a result some of the questionnaires are not fully answered.

56% of respondents indicated they have had training in EE or environmental studies. Educators' knowledge of EE also puts them in a better position to respond adequately to questions especially where they are requested to make contributions on the synergy between EE and OBE. The respondents have a variety of qualifications (See appendix: F Qualifications of educators). The distribution of qualifications indicate that they are informed enough to make valuable contributions. All of them also are experienced educators i.e. they have been teaching for a number of years (see figure 3, which is a summary of responses on the question of experience)
The teachers also received their qualifications at different times. This is crucial because the year of qualification indicates the kind of curriculum one was taught and the researcher therefore can make informed speculations about the knowledge and orientation of a teacher (See Figure 4 on qualification periods of teachers).

The respondents were also drawn from a variety of communities ranging from farms to urban areas. However, the majority of the respondents is from rural areas followed by urban and farms (See Figure 5 on the response of respondents on the level of development around their school).
3.4 Data collection.

The process of data collection spanned over a period of four months from July to October. The researcher needed a lot of time because it is not easy to enter schools and administer questionnaires. The period of administration of questionnaires in one school took about two weeks.

Permission was granted for the administration of questionnaires provided they did not clash with the running of the school. This necessitated that questionnaires were given to teachers to fill at home and bring them to school for collection. Usually not all questionnaires were returned and a variety of excuses were given, the most common being forgetfulness. After all the questionnaires were collected they were analyzed for completeness and accuracy. Many of the questionnaires were returned to the respondents for completion. This took a lot of time and travelling.

Most of the respondents indicated that the investigation was interesting, hence, a high return rate.

3.5 Data analysis

Based on the responses from the respondents, the researcher separated the responses into three categories; teachers’ perceptions and understanding of approaches and methods in EE, teachers perceptions and understanding of
approaches and methods in OBE and teachers perceptions and understanding of the synergy and application of EE methods and approaches in OBE or C2005.

Out of the interpretations of the responses, a chapter has been produced to present the findings of this study. (Appendix G: a summary of responses to the interview schedule)

3.6 Conclusion.

The research sample of this study comprised teachers in the Rustenburg District in the primary schools. Their background has been analyzed by this study, their qualifications, experience, their training in OBE and EE and also the level of development around their schools has been analyzed.

The methods of data collection and how the data will be analyzed have been looked at. In the next chapter (4) the results and discussions on the educators' perceptions and understanding of OBE and EE methodologies and approaches will be presented.
Chapter 4

Educators' perceptions and understanding of EE and OBE approaches and methodologies.

4.1 Introduction.

In this chapter, responses to the questions relating to the educator's perceptions and understanding of EE and OBE approaches and methodology are described and discussed. Educators' understanding of the nature of EE and OBE are examined amongst others. This chapter will cover responses to questions 2.1 - 2.11 and questions 3.1 - 3.10 (Appendix: G).

The responses are categorized as follows:

- Educators' perceptions, understanding and familiarity with the methodology and approaches of EE (2.1 - 2.11, Appendix: G)
- Educators' perceptions, understanding and familiarity with the methodology and approaches of OBE (3.1 -3.10, Appendix G)
- Educators' understanding of the congruence between OBE and EE in approaches and methodology (3.11-3.19, Appendix G)

4.2 Educators' perceptions, understanding and familiarity with the approaches and methodology of EE.

In order to establish the educators' perceptions and understanding on the nature, the approaches and methodology of EE, a set of questionnaires were administered. Appendix: A lists the questionnaires and Appendix G provides detailed responses as they were transcribed. Figure 6 provides a graphic representation of the responses for questions 2.1-2.11 and a graphic comparison between the "Yes" and "No" responses to a variety of questions.
In order to establish the educators' understanding and familiarity with the concept EE and its nature, several questions were asked.

Q2.1 "Are you familiar with the concept EE"
Q2.2 "Do you understand the definition of the concept mentioned above"
Q2.3 "Are you familiar with the aims and objectives of the concept mentioned above"

The understanding of the concept EE is very crucial in this study. The understanding or lack of it either forms the basis or failure of this study. The understanding of EE calls for the understanding of the historical background of the evolution of the concept. Respondents who lack background knowledge of the concept may fail to comprehend philosophical underpinnings of the concept. Only 12 out of 72 respondents indicated that they are not familiar with the concept. Out of interest the researcher interviewed the respondents who indicated that they are not familiar with the concept (see figure 6). Only 2 out of 12 respondents indicated that they do not have either the academic knowledge or the casual understanding of the concept. They promised that they were going to use their contextual understanding of the concept to answer subsequent questions.
The understanding of the definition of EE is also very important for this study. International literature on the definition of EE maintains that, a proper understanding of the various definitions empowers one to formulate an opinion about what should go into EE. The definition of EE is not cast in stone. It is time and space specific. EE is about a way of life, it is about how we perceive a human being's position in relation to the universal objects, and it is about exploitation of resources as opposed to sustainable use. The definition of EE calls for the connection between education and the quality of life.

Out of 72 respondents, 61 indicated that they understand the definition of EE (see figure 6 and appendix G for details). The understanding of the definitions of EE will prove to be very crucial in the application of EE methodologies in OBE in 4.4. The understanding of the definition of EE is closely related to objectives and aims of EE. Either the definition flow from the objectives and aims or the objectives and aims flow from the definitions.

Knowledge of the aims and objectives informs the understanding of methodology and approaches applied in EE. Fifty-nine out of 72 respondents indicated that they are familiar with the objectives and aims of EE. This is very crucial again for application of EE in OBE in 4.4.

Figure 7 graphically represents the responses of the participants in the three questions. The understanding of the aims and objectives of EE (Q2) puts the respondents in a better position to understand and appreciate the synergy between OBE and EE unfortunately only 5% of the respondents were familiar with them. 61% was fortunately aware of the definition of EE and therefore not a bad sample for the purposes of this research. They will also be in a position to compare and contrast the outcomes of EE and OBE.
Question 2.4: whether the participants have been or are involved in the teaching of EE.

_Q2.4 "Have you ever taught EE?"

Forty-two out of 72 respondents indicated that they have taught environmental studies and not EE. Environmental studies have been part of the primary school curriculum in the areas, which were previously Bophuthatswana. Most of the educators also indicated that they had environmental studies as part of their PEUP (Primary Education Upgrading Program).

Only 30 out of 72 respondents never had a chance of practicing EE or environmental studies. The need to have experience in terms of applying EE in class cannot be over emphasized. The percentage of the respondents with experience is good enough to get credible insight into the practices of EE.
Questions 2.5, 2.6, 2.7 and 2.8 were asked to get the participants' insight and understanding of the approaches and methodology of EE.

Q2.5. "Are you familiar with the key aspects or principles of EE?"
Q2.6. "Do you think that EE should be taught as an independent subject?"
Q2.7. "Do you agree that teaching should integrate knowledge?"
Q2.8. "Do you agree with the notion that knowledge should be integrated i.e. be holistic?"

These are very pertinent questions on the approaches and methodology of EE. The principles of EE provide the key base on which the operations of EE occur. They give guidance on the way EE should treat knowledge and methodologies. (see Chapter 2.2 on the list of principles of EE).

Thirty-eight out of 72 respondents indicated that they were familiar with the key aspects of EE, 29 were not aware of them and five did not answer the question. The knowledge of the principles of EE are very crucial in order for the respondents to respond accurately in questions to 2.6, 2.7 and 2.8. The percentage of the respondents who are aware of the principles is, however, good.

On the question whether EE should be taught as a separate subject (Q2.6) 47 respondents said, "Yes", 24 said "No" and one did not answer the question. From private conversations with the respondents, they indicated that from colleges to primary schools environmental studies or EE has been taught as a separate subject even though EE literature indicates the opposite.

Chapter 2.3 of this study indicates that EE should not be taught as a separate subject. Stockholm 1977, Belgrade 1975 and Tbilisi 1977 in UNESCO-UNEP (1985b) indicate that EE should be interdisciplinary or cross-curricular. This approach has been defined as teaching in which one or more subjects are expressed in terms of
their relationship (UNESCO-UNEP 1985:8). Common areas between subjects are emphasized.

Responses to questions 2.7 and 2.8 produce a powerful correlation. Questions 2.7 and 2.8 are on whether knowledge should be integrated and whether teaching should integrate knowledge (figure 8 indicate the relationship between question 7 and 8).

![Figure 8: Relationship between questions 7 & 8](image)

The respondents agree with the most important methodological aspects and principles of EE. Sixty-nine respondents out of 72 agree with the fact that EE represents a move away from atomistic fragmented discipline based approach to education. EE, therefore, stands for integration of knowledge. Chapter: 2.4 of this study alluded to the approaches of EE. It is a very interesting point to note that educators, in their majority, are aware of the integration of knowledge.

Teaching should encourage integration of knowledge. Sixty-nine out of 72 respondents also agrees with this fundamental EE methodological principle. Questions 2.9 and 2.10 border on the skills and values.
Q2.9 "Does EE establish sound values within learners?"

Q2.10 "Does EE contribute to the development of skills such as critical thinking, decision making, investigation, and analysis?"

The significance of these questions is overwhelming. The above questions draw on the nature of EE i.e. the processes of achieving some EE objectives. EE does not only develop individual cognition but all other domains are addressed. EE integrates knowledge, understanding, skills, values, and attitudes to produce a complete well-rounded individual. The focus is on the development of understanding environmental issues, skills, values, and attitudes. Value development and clarification is very significant in EE. Values produce behavior which impacts directly on human-environmental relationships.

Sixty-nine out of 72 respondents, in both questions, agree with the notion that EE contributes to the development of values and skills. Skill development is enhanced by a diversity of methods used in EE. The hands-on and practical methods of EE enhance analysis, investigation, critical thinking, and others. This aspect will be explored further in 4.4.

Question 2.11 deals with the practical aspect of EE methodology.

Q2.11 "Does your school have any environmental project?"

Question 2.11 concludes the section on EE methodology. It requires the respondents to indicate whether they have an environmental project in their school or not. 37 out of 72 respondents indicated that they have environmental projects in their schools. This indicates that most schools and educators have not yet moved from theory to practice. There is an absolute need to implement the ideas that characterize the majority of the responses to this questionnaire.
4.3 Educator perceptions and understanding of OBE methodologies and approaches.

Section two of the questionnaire contains a set of 10 questions that aim to distill the perceptions and understanding of educators on OBE methodology and approaches (see appendix A). Appendix G presents a detailed transcription of the responses and figure 9 presents a graphic representation of responses to the 10 questions.

The questions presented to the educator had a clear intention of establishing perceptions and understanding of methodologies and approaches in OBE and how they relate to EE generally.

The first two questions are:

Q3.1 “Have you been using OBE?”
Q3.2 “Do you agree with the approaches used?”

These questions wanted to establish the suitability and involvement of the educators in OBE. Their involvement would give them insight and depth to answer some of the questions that will follow.
Sixty-four out of 72 respondents indicated that they are using OBE in their teaching as C2005 has been introduced in the foundation and intermediate phases. An informal interview indicated that most educators have been using OBE for the past five years. As a result most of them are familiar with the concepts, methods and approaches used in OBE. Fifty-eight out of 72 respondents indicated that they fully agree with the approaches used in OBE. Four objected to the OBE approaches and 10 did not respond to the question. Informal discussions revealed that the 10 members were not yet familiar with the use of OBE in C2005. The high response percentage, to the researcher’s opinion, is due to the training given to the educators by either Thabane College of Education or the Department of Education subject advisory.

Questions 3.3, 3.4 and 3.5 are focused on the integration of knowledge (cross curricula and interdisciplinary nature of OBE)

Q3.3 “Does integration of knowledge as proposed by OBE and EE add value to your teaching?”

Q3.4 “Are you familiar with the cross curricular approach?”

Q3.5 “Are you also familiar with the interdisciplinary approach?”
The response to Question 3.3 is very interesting. Fifty-nine out of 72 respondents indicate that integration of knowledge in OBE and EE add value to teaching. The response indicate that there is an agreement in terms of integration of knowledge between EE and OBE. Information that is presented holistically is acknowledged and atomism and reductionism are rejected.

The respondents went further and indicated that they are familiar with cross-curricular and interdisciplinary approaches, 59 and 58 for questions 3.4 and 3.5 respectively. This is a positive note because OBE calls for integrated, cross curricula application of knowledge. OBE also calls for cross integration of critical and specific outcomes. The learning areas should not be seen as separate entities rather as fields of knowledge that could be integrated to produce a well-rounded human being (see Chapter 2.3 for more details). The understanding of cross-curricular and interdisciplinary approaches will prove to be fruitful in 4.4.

Question 3.6 is more direct; it asks the respondents whether they are applying the approaches mentioned above. The application of knowledge is very crucial both for this study and for the understanding of OBE. For educators to make valuable contributions, they need to have practical experience of OBE. Fifty-five out of 72 respondents apply the approaches.
Question 3.7 and 3.8 focus on OBE and EE.

Q3.7 "Do you agree with the opinion that all learning areas should be taught from an integrated interdisciplinary perspective?"

Q3.8 "Do you find it possible to teach EE from a variety of learning areas?"

The above mentioned questions require the respondents to indicate whether they agree or reject the notion that all learning areas should be taught from an interdisciplinary perspective and whether do they find it possible to teach EE from a variety of learning areas. Seventy out of 72 agree with the notion that all learning areas should be taught from an integrated perspective. This is a clear indication that the educators sampled for this study are familiar with OBE. On whether EE could be taught from a variety of learning areas 61 out of 72 indicated that it is possible to teach EE from a variety of learning areas. This response is consistent with the responses in 4.2. The response to this question will prove to be very valuable for 4.4.

Questions 3.9 and 3.10 focus on C2005.

3.9 "Has the introduction of environment as a phase organizer in C2005 made integration of knowledge possible?"

3.10 "Are you familiar with the critical and the specific outcomes in C2005 that are relevant to EE?"

The introduction of the environment as a phase organizer in C2005 is seen as a break-through in EE. For many years EE has called for integration of knowledge around environmental issues that are meaningful to learners e.g. pollution. A phase organizer pulls together all specific outcomes from different learning areas that have common focus. For question 3.9, 67 respondents agreed, 10 did not respond and five objected. This is a positive trend, as educators are aware that EE approaches and knowledge are accommodated in C2005. 61 out of 72 respondents indicated that they are aware of the critical and specific outcomes that are relevant to EE. This is exceptionally pleasing and in agreement with Chapter 2. It is an
indication that EE approaches and outcomes are accommodated in OBE and C2005.

4.4 Educators' understanding and perceptions on the congruence in methodology and approaches between OBE and EE.

This is a very crucial section of the study. The question asked is: What is the degree of congruence between OBE and EE in terms of methodologies and approaches.

Question 3.11 and 3.12 focused on the methods used in OBE and EE.

Q3.11 "Can you mention some of the methods used in OBE?"
Q3.12 "Can you mention some of the methods used in EE?"

The two questions were introduced as a section on methodology. Interestingly, even though the questions are on methods and not methodology, the respondents reacted with enthusiasm.

Responses to question 3.11 include the following:

- Discovery
- Discussion
- Question and answer
- Interview
- Researches
- Group work
- Experiments
- Field methods
- Hands on experience
- Participative method
- Eclectic
- Making models
- Identification method
- Observation methods
- Drama
- Survey
- Debate
- Team teaching and Learning
- Child centered methods
- Action competence approaches
Responses to question 3.12 were:

- Discovery
- Field Trips
- Excursions
- Project
- Research
- Experiments
- Use of school grounds

- Participative methods
- Eclectic
- Exploratory methods
- Practical demonstrations
- Story telling
- Solitaire

Question 3.13 focuses on the differences in approach between EE and OBE. The question tapped on the understanding of the methodologies of OBE and EE. It also demanded the educators' understanding of the differences between OBE and EE methodologies.

Q3.13 "Do you think that there is a significant difference between the approaches used in OBE and EE? (if "yes" or "no" explain).

The responses included the following:

- No. Same methods are applied
- No. Learners are highly involved
- No. They are all child centered and self exploratory
- EE and OBE are related and environment is a phase organizer
- No difference
- No, Both encourage practical experience
- I don't know, I have not attended EE training
- I have not attended training on EE so I don't know the difference
- No. Because methods are integrated and the same
No. Both use the same approaches and methods
No. They both integrate knowledge
No. Both in OBE and EE learners are responsible for their learning
EE and OBE have the same objectives or outcomes
No. They have the same philosophical and pedagogical approaches
No. They more or less work together
No. Both emphasize practical experience
No. They are all learner centered
No. They are all outcomes based
No they are closely related.
OBE emphasizes integration of knowledge and that is exactly what EE is about
I do not know

Questions 3.14 and 3.15 focused on the problems (if any) in the introduction or inclusion of EE in OBE in general and C2005 in particular. This was a very practical question on the experiences of educators.

Q3.14 "May you list problems (if any) in the implementation of OBE in general and C2005 in particular?"

Responses for question 3.14 included the following:

There are no problems as such; teachers don't have the courage to implement OBE. Educators complain about material and terminology.
Planning of learning experience
Teachers are not familiar with the concepts used
Some of the slow learners lack behind
Written work is horrible
Too much paper work for the teacher
Training for teachers is not enough
Lack of resources
Educators are not familiar with the approach
Overcrowded classrooms
Theoretical work is sacrificed
Finance
Illiterate parents who cannot make an input in the education of their children
Different information about OBE
Lack of support from the employer
Inappropriate teacher training and orientation

Q3.15 "May you list problems in the application of EE approaches in OBE and C2005?"

Responses for question 3.15 were:

Lazy learners become passive
Parents are not familiar with the new approaches
Terminology
Lack of knowledge
Negative attitude of educators
No relevant material resources
There is always a danger in field trips
There are no problems at all. They share the same goals
Some educators may use EE as an excuse to take learners out of class
Lack of knowledge of EE by educators

Question 3.16 was on the solutions to the problems mentioned in 14 and 15.

Q3.16 "May you suggest solutions to the problems mentioned in 14 and 15"

Workshops and follow ups
Learners ability should be considered for promotion
Terms should be simplified
Paper work reduced
School environment policy should be developed
Empowerment of educators in EE is advised
Provisioning of more resources is important
Creation of posts
By re-looking at resource allocation
Teachers must study and research on their own

A simple but very critical question 3.17 that was presented to the educators' on the general comments regarding EE and OBE. This was an open-ended question which gave respondents a chance to express freely their perceptions and understanding of the congruence between EE and OBE methodologies. Some of the responses were very interesting and shed more light to this study.

Q3.17 "Would you like to make any other comment regarding EE in OBE?"

The responses were:

- EE must be included in the curriculum
- EE must be taken very seriously because it affects all life
- Parents should be enlightened
- EE and OBE should further be integrated
- I think educators should be given more training on environmental issues and approaches and how EE relates to OBE
- There is good integration between EE and OBE
- Yes. There should be more focus on EE
- EE must be included in the curriculum
- This is a break-through, they agree
- This is an opportunity for EE to be integrated into the curriculum
EE must be included in the curriculum as it involves all and is participative

This is a success

EE should be implemented so as to make learners aware of the natural resources and how essential they are to life in general

EE links the school, home and community

EE should be taught in an integrated manner rather than as a separate subject due to the overloaded curriculum. It should be like spice to food.

4.5 Conclusion.

Chapter 4 has been a detailed analysis of the results obtained from the questionnaires to the educators.

Figure 6 indicates that some of the sampled educators are familiar with EE and its approaches. Eighty-nine% of the sampled educators have also indicated that EE and OBE have a lot in common.

Respondents also indicated that they are familiar with OBE concept and they are applying them. They are also familiar with the interdisciplinary approaches advocated by OBE. The respondents also indicated that OBE accommodates EE concepts, knowledge and approaches.

Section 4.4 has focused on the synergy between OBE and EE. It is the heart of this study. It has looked into very critical issues related to EE and OBE methodologies and approaches.

The respondents have given a very powerful verdict to the hypothesis of this study i.e. OBE in South Africa allows for the application of EE methodologies and approaches.
The researcher does not want to pre-empt the outcomes of Chapter 5 in this conclusion, however, informative responses have been given to all questions.

The details of the analysis and conclusions will be given in Chapter 5.
Chapter 5
The congruence between the methodologies of EE and OBE: findings, recommendations and proposals.

5.1 Introduction.

This study has focused on the opportunities and constraints that exist in OBE for the implementation of EE methodologies and approaches. The study has attempted to examine and evaluate the degree of compatibility between EE and OBE methodologies and approaches. The emergence of EE as an alternative approach to education was also examined. The contest that this study has brought forward is between compartmentalized education versus interdisciplinary and cross-curricular education. The findings of this study indicates that OBE rejects atomistic and compartmentalized education; it emphasizes holism, integration, learner centeredness and experiential education, to mention a few.

5.2 Findings of the research.

The following findings emerge from the study:

- Both EE and OBE reject compartmentalization of knowledge and there is a need to integrate knowledge (Chapter 2)
- Both EE and OBE encourage a cross-curricular and interdisciplinary approach; however, there is lack of clarity in terms of the definitions of interdisciplinary education (Chapter 2 and 4).
- There is a good understanding of EE and OBE methodologies by the majority of educators (Chapter 2 and 4) in the Rustenburg District.
- Educators are familiar with the methods of OBE and EE (Chapter 4).
- Educators agree that the introduction of OBE also acknowledge the methods and approaches of EE (Chapter 4).
Despite the congruence in EE and OBE, there are problems in philosophy, approaches and methodologies of OBE that need to be solved for the best application of EE processes (Chapter 4).

5.2.1 The educators understanding of EE approaches and methodologies.

Chapter 4 (Figure 6) indicates educator's responses to the understanding of EE approaches and methodology. Various factors could be attributed to the understanding or lack of it.

Eighty-three % of the educators indicated that they are familiar with EE. This is because of a variety of factors:

- From the 1980s EE has been offered in a variety of colleges in Bophuthatswana. The qualification years of the educators put them in the previous 15 years category. The majority of them (Approximately 80%) qualified between 1975 and 1990 (Chapter 3).
- Those who did not attend in Bophuthatswana had exposure to EE either as it was presented as environmental studies (Pre 1980) or as they furthered their studies at higher institutions.

Lack of knowledge of EE or even environmental studies which accounted for 20 % (Chapter 4) could also be ascribed to a variety of factors:

- The subject policies of various colleges determined how EE was implemented within colleges. Subject groupings excluded other students from studying EE. Sometimes time tabling practically made it impossible for some students to do EE. In some instances EE was an ancillary therefore its value was relegated to the likes of physical education. It was both poorly staffed and poorly taught.
- The institute of education also excluded other colleges from offering EE.
- Three colleges out of nine offered EE. Not all educators have an experience with
Questions 5 - 9 focused on the knowledge of key aspects and the cross-curricular nature of EE. The majority of the educators agree that knowledge should be integrated and EE should be cross-curricular and interdisciplinary (Chapter 4).

The Tbilisi principles state that EE should be interdisciplinary in approach, drawing in specific content of each discipline in making possible a holistic and balanced perspective (UNESCO-UNEP 1978:4). This means that EE should cover ecological, social, cultural, political and economic issues. Stapp (1978:2), Hurry (1981:3) and Gough (1989:232) maintain that EE should be holistic in approach. Irwin (1981:3-6) maintain that EE should link subjects thus become a key to a holistic rather than fragmented view of both knowledge and humankind.

There is a general understanding of what the cross-curricular approach entails. In terms of the cross-curricular nature of EE, educators agree (Chapter 4) with Irwin (1981:3) that EE is fundamentally cross-curricular in its approach. Richards (1982:9) and Musonda (1982:4) maintain that EE should also be taught through other subjects. This view represents a multidisciplinary and integrative view of education.

Based on the results of questionnaires on the educator's understanding of EE methods and approaches the following conclusions were made:

- Most educators are familiar with EE
- Most educators are not fully aware and familiar with the aims, objectives and principles of EE
- Most educators agree that EE knowledge should be integrated
- Educators agree that EE is cross-curricular in nature
- Educators finally agree that EE contributes to value education.
5.2.2 The educators understanding of OBE approaches and methodologies.

The study indicates that the majority of educators understand OBE approaches and methodology. The following came to the fore:

- Most of the educators who participated in this study use OBE in their teaching.
- They appreciate the new OBE approach.
- Integration of knowledge as proposed by OBE and EE add value to the educators' teaching.
- Even though educators use OBE approaches they are not familiar with concepts that describe the strategies of the approach e.g. cross-curricular approach, interdisciplinary and holistic approach (Chapter 3 and 4).
- Only about 48% of the educators apply the approaches and methodologies of OBE, 50% do not apply them and 2% is not aware whether they use the approaches or not.
- The fact that the environment is one of the phase organizers made most respondents to agree that they are able to teach EE from a variety of learning areas.
- More than 98% agree with the opinion that EE should be taught from an integrated interdisciplinary perspective.
- Over 67% of educators are familiar with the critical and specific outcomes in C2005 that are relevant to EE.

From literature that the researcher reviewed and the information obtained from the questionnaires, there is a general understanding of the basic philosophy and methodology of OBE by educators (Chapter 3, 4). The position and application of EE within OBE is, however, not clearly understood (Chapter 4). Most educators, however, appreciate the fact that environmental education is very crucial in OBE.
Because the environment is a phase organizer, the critical outcomes and specific outcomes have to be organized around environmental themes across the learning areas.

Most educators (Chapter 4) indicate that it is difficult to translate theory into practice. The majority of educators find it difficult to apply OBE approaches and methodologies over and above the application of EE. Even though EE and OBE are related in terms of methodologies and approaches there is a need to clarify some of the key concepts that build the approaches of OBE. To define what an interdisciplinary way of teaching is and how it can be translated into tangible classroom practice is a very difficult task for teachers.

Some of the questions that are raised are:

- What is the possible relationship amongst disciplines?
- How are disciplines coordinated in time and space?
- What is the teacher's role?

It is the opinion of the researcher that lack of clarity and sometimes ambiguity in EE and OBE literature and guidelines partly account for some of the problems of implementation of EE in OBE and OBE in general. To answer these questions a further research is necessary.

### 5.2.3 Educators understanding of the congruence between EE and OBE methodology

The following emerged from the results:

- The instructional methods of OBE and EE are similar (2.5.3 and 4.4)
- There is no significant difference in OBE and EE approaches (4)
- Despite commonalities in OBE and EE approaches, there are problems in the general implementation of OBE and C2005 (4.4)
Despite commonalities in OBE and EE, there are problems in the application of EE approaches in C2005 (4.4).

A range of solutions could be suggested to solve problems in the implementation of EE in OBE and in the implementation of OBE in general and C2005 in particular (Chapter 4).

5.3.4 The meaning of the congruence of EE and OBE methodologies for educators in South Africa.

Question 11 and 12 on the methods of EE and OBE revealed that there is a powerful connection and congruence between OBE and EE methods. A summary of responses reflects various educational perspectives. These perspectives, or ways of seeing things, affect our ways of doing things in education in South Africa. Some of the perspectives are the following:

- Behaviorist perspective (Behavioral change by making people aware)
- Experiential learning perspective (Educate through experiences in nature)
- Constructivist perspective (Learners construct their own meaning)
- Liberal humanist perspective (Allows natural potential to develop)
- Socially critical perspective (Social processes for the creation of knowledge and critical intervention for change)
- OBE (focus on outcomes)

The conclusion emerging out of the analysis of responses (Chapter 4) is that EE or OBE should not be enslaved by any of the perspectives indicated. In fact, both OBE and EE should draw ideas and methods when appropriate. These perspectives have had tremendous effect on EE trends over time. Each perspective informed the methods and approaches of EE (Appendix A: questions 11 and 12). OBE has captured all EE instructional trends.

Educators were asked whether there was a significant difference between OBE and EE approaches. Ninety-eight percent of the respondents said no, giving a variety of
reasons (Chapter 4 and appendix A). This response corroborates arguments in the literature review (Chapter 2.3). Curriculum development approaches of EE and OBE are not distinctly different (Chapter 2). Various curriculum design approaches for both EE and OBE are referred to.

Besides congruence in curriculum methodology there are a number of areas that reflect congruence in approaches of both OBE and EE in general (educators refer to some of them: Appendix A) these are

- same methods (Chapter 4)
- learner centered (opcit)
- experiential (opcit)
- both are holistic (opcit)
- both encourage integration of knowledge (opcit)
- both encourage cross curricular approach (Op cit)
- both are outcomes based (opcit)
- both have similar pedagogical and philosophical approaches (opcit)

Question 14 distilled a lot of information about the implementation of OBE in general and C2005 in particular (Appendix A: question 14 and 4.4). Ninety-nine percent of educators indicated that there are problems with the implementation of OBE and C2005. This concurs with the literature review (Chapter 2) and the Chisholm's report (2000:5-10).

5.3 Problems in the implementation of South African OBE and EE.

Over and above the problems that have been indicated in Chapter 4 and Appendix A, Chisholm (2000: vi-vii) highlights several key problems of C2005 and South African OBE in general:

- A skewed curriculum structure and design
Lack of alignment between curriculum and assessment
Inadequate orientation, training and development of teachers
Learning support materials that are variable in quality, often unavailable and not sufficiently used in classrooms
Policy overload and limited transfer of learning into classrooms
Shortage of personnel and resources to implement C2005
Inadequate recognition of curriculum as the core business of education departments

Inter alia, language is a serious problem amongst the conclusions made by this study. Schwarz (1994:87) maintains that OBE language is limiting and dehumanizing. OBE is mechanistic and instrumentalistic and has a constraining effect on the reader. Schwarz further maintains that OBE terminology is behaviorist, linear, and traditionalistic and does not invite debate. OBE manufactures new terminology in an alarming rate and that makes it difficult for the learner and the educator to keep pace with the changes. OBE language is a language of business. Ultimately the language of OBE is controlling, narrow, mechanistic and impoverished.

Kundlas (1994:33) also noted generic OBE flaws, which were also noted by the educators (Appendix A):

Demanding on the part of the teacher
Teachers are faced with diluted expectations
Student boredom is a problem especially fast learners
Grading is confusing
Students experience apathy and procrastination
Assessment is a big problem
Enrichment preparations are a problem
OBE is not well accepted by Higher Education
Parents of fast learners feel that their children are neglected
Keeping track of outcomes could be taxing
OBE is expensive to implement

Dykman (1994:37), on the other hand, argues that critics of OBE are three fold:

- Some outcomes disguise a politically correct agenda and therefore infringe on the rights of the parents to teach values
- The curriculum is watered down
- The outcomes are not clearly defined

McNeir (1994:31) agrees with Dykman (1994) that OBE is more affective than academic and OBE views education as a means to an end, i.e. predecided outcomes that are antithetical to the very nature of education. The ultimate effectiveness of OBE is questionable because there has been minimal research on it.

McKeenan (1993:343-350), Boschee (1994:195) and Fritz (1994:80) sum up nicely the conclusions of this study on the problems pertaining to the implementation of OBE in general and C2005 in particular.

Fritz (1994:79-81) argues that OBE suffers from paradigm blindness, it means different things to different people. OBE is indoctrinating. Fritz (1994:80) maintains that:

"In OBE I smell Sparta, Rousseau and Hegel: The child is the property of the state and must be modeled to serve the interests of the state"

OBE is outcomes compelled schooling (Fritz 1994: 81).

Boschee and Baron (1994:195) maintain that OBE is not different from Skinnerian stimulus response conditioning and indoctrination. They conclude that OBE devalues the affective dimension of education and it limits inquiry and creativity in education.
Question 14 zoomed into problems that may be experienced in the application of EE processes within OBE and C2005. The researcher would like to treat question 14 and question 17 together as question 14 has direct bearing on question 17.

The responses of educators to question 14 make the researcher conclude that there are problems with educators, learners, parents and resources (Appendix G and Chapter 5).

- **Educators**
  - Lack appropriate OBE instructional knowledge
  - Lack EE philosophical and instructional knowledge
  - Negative attitude towards innovations

- **Learners**
  - Negative attitude towards environmental issues
  - Lack of support and motivation from parents and educators
  - Resistance to change
  - Rejection of new approaches of instruction
  - Boredom and procrastination

- **Parents**
  - Lack of knowledge of OBE
  - Resistance to new methods
  - Lack of motivation to get involved in learner support activities
  - Lack of time
  - Lack of financial power to support learners

- **Resources**
  - Lack of learner support material
  - Lack of learning and teaching aids
• Lack of physical resources
• Lack of finance
• Understaffing

Whilst these problems are pertinent and generic to the school setup, responses to question 3.17 (Appendix G and Chapter 4.4) are more specific to EE in OBE. The researcher has noted three broad conclusions:

➢ The respondents agree with the literature review (Chapter 2) and the philosophical underpinnings of EE and OBE are similar.
➢ That the integrative, holistic, cross curricular approaches of EE are applicable in OBE in general and C2005 in particular.
➢ That the methodological approaches to curriculum development of EE and OBE share a lot in common.

The researcher would like to refer to a few responses to question 17 to illustrate the conclusions made above:

"EE and OBE should further be integrated."

"I think educators should be given training on environmental issues and approaches and how EE relates to OBE."

"This is a break through, EE and OBE agree closely."

"This is a success."

Having alluded to the findings and conclusions of this study, the researcher will now refer to some Proposals suggested by this study.
5.4 Proposals.

Responses to question 3.16 and 3.14 (Appendix G) contain educators' proposals and solutions to issues and debates raised in this study:

> There should be workshops and follow-ups on EE and OBE language, content and approaches. The problem that has been highlighted in 5.3 is that there is poor understanding of EE approaches e.g. integration and cross-curricular approaches. Educators will be able to work with EE concepts better. This will further simplify the application of EE and OBE.

> Even though the Department of Education and Tlhabane College of Education train educators, there is still poor understanding of the fundamental basics of OBE e.g. OBE terminology, development of learning programs, approaches, methods and assessment. There is a need to further train educators and to provide constant support and mentoring at schools.

> The Chissholm's (2000) proposals to C2005 should be implemented leading to the development of the new curriculum statement.

> The review of C2005 should also couple the review of OBE and EE language. The language should be more friendly and accessible to the educators and the parents.

> For better implementation of OBE and EE, physical, human resources and support should be provided.

> There should be more research into the methodologies of EE and OBE so that there could be better translation in the classroom.

> More support should be given to teachers' use of the environment as a phase organizer.

> Various national projects e.g. EECl and NEPI (National environmental policy initiative) should give equal attention to all parts of the country so that educators could be informed about the content and methodologies of EE and OBE and how to integrate the two.

> Environmental policy packs should be made available to all schools so that EE and OBE practices could be implemented in the school curriculum.
EE and OBE curriculum initiatives should be supported financially by both the government and NGOs.

5.5 Conclusion

The findings and the conclusions of this study indicate that there is a powerful congruence in methodologies of OBE and EE. There is a need to spend more time in defining EE and OBE approaches to knowledge, education, learning and teaching.

This study has presented a variety of proposals to the problems identified in terms of the application of EE in OBE. The problems identified are broad educational problems that not only impact on EE but on other learning areas as well.

It is also the conclusion of this study that OBE has more value to EE than problems. The advantages afforded by OBE for the application of EE processes outweigh the disadvantages. This goes well with what one educator said in describing the relationship between EE and OBE:

"This is a break through, OBE and EE agree closely"

5.6 Assessment of the study

Lack of time and pressure of work discouraged the researcher to undertake a more detailed research. The researcher has, however, gained a lot of insight and invaluable experience in the process of conducting this study.

The researcher, therefore, suggests that:
➢ The questionnaires could have been structured and conducted better to gain more information from the respondents
➢ Small scale interviews could have been conducted to get more depth and insight beyond the responses to questionnaires
More follow-ups could have been made on the questionnaires that were not completely filled.

Data collection could have been conducted over a longer time to allow the researcher time to think over the instruments to be used and the data analysis techniques to be used.

However, this study can make a valuable contribution to the implementation of OBE in general and the integration of EE in OBE. It also emphasized that OBE offers adequate opportunities for educators to implement EE in and outside the classroom.

As one educator commented:

"I think educators should be given more training on environmental issues and approaches and how EE relates to OBE."
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Appendix A

Questionnaires to teachers in the Rustenburg District on Outcomes-Based Education and Environmental Education.

1. Personal information

1. Are you a teacher?
   - Yes
   - No

2. How long have you been teaching?
   - Years
   - >5
   - 10
   - >10
   - >20

3. For how long have you had your teaching qualification years?
   - >1
   - >5
   - >10
   - >20

4. Have you had any training on OBE?
   - Yes
   - No

5. Have you had any training in environmental education or studies?
   - Yes
   - No

6. What is the level of development around your school?
   - Urban
   - Rural
   - Farm

2. Questionnaires related to Environmental Education

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
<th>Yes</th>
<th>No</th>
</tr>
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<tbody>
<tr>
<td>1. Are you familiar with the concept environmental education?</td>
<td></td>
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<tr>
<td>2. Do you understand the definition of the concept mentioned in 1. above?</td>
<td></td>
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</tr>
<tr>
<td>3. Are you familiar with the aims and objectives of the concept mentioned in 1.</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>4. Have you taught environmental education or environmental studies?</td>
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</tbody>
</table>
6. Do you think that environmental education should be taught as an independent subject?

7. Do you agree with the thinking that knowledge should be integrated, i.e. should be holistic?

8. Do you agree that teaching should integrate knowledge?

9. Does Environmental education contribute to the establishment of sound values within learners?

10. Does environmental education contribute to the development of skills such as critical thinking, decision making, investigation and analysis?

11. Does your school have any environmental project?

12. Does environmental education activities in your school provide learners with an understanding that environmental issues relate to many disciplines or learning areas?

### Environmental education approaches and methods in Outcomes-based education.

#### Answer

1. Have you been using OBE in your teaching?

2. Do you agree with the approaches used?

3. Does integration of knowledge as proposed by OBE and environmental education add value to your teaching?

4. Are you familiar with cross-curricular approach?

5. Are you also familiar with interdisciplinary approach?

6. Do you apply these approaches, mentioned in 1. and 2., in your teaching?

7. Do you agree with the opinion that all learning areas should be taught from an integrated -interdisciplinary perspective?

8. Do you find it possible to teach environmental education from a variety of learning areas?

9. Has the introduction of environment as a phase organiser in C2005 made integration of knowledge possible?

10. Are you familiar with the critical and specific outcomes in C2005 that are relevant to environmental education?
11. Can you mention some of the methods (e.g. project method) used in OBE?

.................................................................

.................................................................

.................................................................

12. Can you mention some of the methods used in environmental education?

.................................................................

.................................................................

.................................................................

13. Do you think that there is a significant difference between the approaches used in OBE and environmental education? (If yes or no explain)

.................................................................

.................................................................

.................................................................

14. May you list problems (if any) in the proper implementation of OBE in general and C2005 in particular?

.................................................................

.................................................................

.................................................................

15. May you list problems (if any) in the application of environmental education approaches in OBE and C2005.

.................................................................

.................................................................

.................................................................

.................................................................
How do you suggest problems (if any) mentioned in 14. And 15. could be addressed?

Would you like to make any other comment regarding environmental education in OBE?

Would you like to have more documentation about OBE and environmental education approaches and methods?

Thank you for your cooperation
### Proposed Structure for an NQF

<table>
<thead>
<tr>
<th>NQF LEVEL</th>
<th>Band</th>
<th>Types of Qualifications and Certificates</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Higher Education</td>
<td>Doctorates Further Research Degrees</td>
</tr>
<tr>
<td></td>
<td>and</td>
<td>Higher Degrees Professional Qualifications</td>
</tr>
<tr>
<td>7</td>
<td>Training Band</td>
<td>First Degrees Higher Diplomas</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>Diplomas, Occupational Certificates</td>
</tr>
</tbody>
</table>

#### Further Education and Training Certificates

| 4         | Further Education | School/College/Training Certificates Mix of units from all (NGOs) |
| 3         | and Training Band | School/College/Training Certificates Mix of units from all (NGOs) |
| 2         |                  | School/College/Training Certificates Mix of units from all (NGOs) |

1 = General Education and Training Certificates = 4

<table>
<thead>
<tr>
<th>General</th>
<th>Senior Phase</th>
<th>ABET Level 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>Intermediate Phase</td>
<td>ABET Level 3</td>
</tr>
<tr>
<td>and</td>
<td>Training Foundation Phase</td>
<td>ABET Level 2</td>
</tr>
<tr>
<td>Band</td>
<td>Pre-school</td>
<td>ABET Level 1</td>
</tr>
</tbody>
</table>
PILOTING SITES AND DISTANCES FROM THE COLLEGE

- BORITE PRIMARY (53 KM'S)
- MONAKATO PRIMARY (49 KM'S)
- TUMAGOLE PRIMARY (8 KM'S)
- MOGONO PRIMARY (18 KM'S)
- TLHABANE EDUCATOR DEVELOPMENT CENTRE
- LEKWANA PRIMARY (2 KM'S)
- LETSOBOGO PRIMARY (15 KM'S)
- ZINNIAVILLE SECONDARY (7 KM'S)
- THUSANONG COMBINED FARM SCHOOL (60 KM'S)

DIRECTIONS:
- N
- S
- W
- E
1. Evaluation of workshop activities.

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>EXCELLENT</th>
<th>GOOD</th>
<th>AVERAGE</th>
<th>CAN BE IMPROVED</th>
<th>WEAK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper Technology</td>
<td>43,75 %</td>
<td>40,63 %</td>
<td>12.5 %</td>
<td>03 %</td>
<td>-</td>
</tr>
<tr>
<td>More about waste</td>
<td>65.63 %</td>
<td>28.13 %</td>
<td>6.25 %</td>
<td>03 %</td>
<td>-</td>
</tr>
<tr>
<td>Puppets</td>
<td>43.75 %</td>
<td>43.75 %</td>
<td>6.25 %</td>
<td>6.25 %</td>
<td>-</td>
</tr>
<tr>
<td>Shapes &amp; numbers</td>
<td>15.63 %</td>
<td>40.63 %</td>
<td>21.88 %</td>
<td>6.25 %</td>
<td>6.25 %</td>
</tr>
</tbody>
</table>

2. Workshop Preparation.
   - Well prepared workshop (100%).

3. Workshop aspects that need improvement.
   - Reduction of activities (53%) – time is too short.
   - Provision of notes (6.25%).
   - Integration of LLC in each lesson (6.25%).
   - Invite learners to workshops (3.13%).
   - Division of afternoon activities into two alternative days (3.12%).

4. Positive (useful) aspects of workshop.
   - All activities (50%).
   - Use of waste material (37.5%).
   - Puppets and paper technology (12.5%).

5. Irrelevant items in the workshop.
   None – 62.5%
   Puzzles – 6.25%
No response 25%.

6. Items to be included in future workshops.
   - more work on technology
   - puzzles and drawing
   - integrating work done in learning areas.

7. How educators are going to apply skills and knowledge acquired in the workshops in their teaching:
   - Shapes will be used for numeracy.
   - Puppets for lifeskills.
   - Use all skills and knowledge for the three learning programmes
     ( - by helping learners to produce learning aids).
     - use more practical approaches.
     - Puppets will be useful tool to help learners to communicate.

8. College Facilitator's comments and the way forward.
   - The educators' inputs are valuable and show that it will be easier for them to integrate the activities of all the four workshops in their teaching.
   - Assessment strategies will be consolidated when educators do portfolios in technology.
   - All the workshops that are organized are training the trainer workshops which means that we seek to capacitate educators and the college facilitators will not organize workshops for learners.
     - Our commitment as the support centre is to help the educators with their problem areas with the hope that educators will use the acquired skills and knowledge in their daily teaching.
   - The concern of the educators about many activities being done in one day is noted, however this must be understood as fulfilling the needs of the schools as agreed upon by the site managers, SGB reps, educator reps and the college during the advocacy meeting held on 04-08-2000.
   - The educators’ responses to the Literacy, Numeracy and lifeskills questionnaires will inform us about the needs that the college will address during the next workshops.

_MANCHADI MATJILA_ RECTOR
TECHNOLOGY EDUCATION WORKSHOP 31-08-2000

WORKSHOP EVALUATION

ITEMS:

1. ASPECTS THAT FACILITATORS ENJOYED.
   - TASK TYPES (12 %)
   - BRIDGE BUILDING (74 %)
   - Clarity of tasks to be executed (2 %)
   - Technological processes (12 %)

2. MEETING OF EXPECTATIONS

   POSITIVE (82 %)
   
   NEGATIVE (15 %)
   
   No response (3 %)
   
   Educators' comments.
   
   Need for more projects.
   
   Help with compiling a portfolio.
   
   Through technology learners will be able to develop skills and share knowledge.
   
   Integration of technology with the other learning areas.
   
   Acquisition of planning skills.
TECHNOLOGY EDUCATION WORKSHOP 31-08-2000

WORKSHOP EVALUATION.

ITEMS:

1. ASPECTS THAT FACILITATORS ENJOYED.
   - TASK TYPES (12 %)
   - BRIDGE BUILDING (74 %)
   - Clarity of tasks to be executed (2 %)
   - Technological processes (12 %)

2. MEETING OF EXPECTATIONS

   POSITIVE (82 %)
   NEGATIVE (15 %)
   No response (3 %)

   - Educators’ comments.
   - Need for more projects.
   - Help with compiling a portfolio.
   - Through technology learners will be able to develop skills and share knowledge.
   - Integration of technology with the other learning areas.
   - Acquisition of planning skills.
Technology can change the way we live.
- Team work, brainstorming and sharing ideas.
- Team teaching.
- Technological processes.
- New terminology of a learning area that is difficult.
- Evaluation of tasks.
- Technology was demystified.
- Task type - interpretation and design.
- Specific outcome 1 as the basic of technological processes.
- Time management.

3. EDUCATORS' EXPERIENCES (Successes and Frustrations) in the teaching of technology.
- Incorporating arts and craft in technology learning programme to make living and meaningful models.
- Using of the design loop in technology teaching.
- Integration of technology with the other learning areas with more confidence.
- Change in teaching approach to make all learning more learner-centred.
- Make learners do group projects and assess their final products.
- Use of the IDEA task in technology lessons.

4. FURTHER TRAINING NEEDED.
- How to compile a portfolio (08 %)
- Design of practical activities using different task types (38 %).
- Assessment in technology, (15 %).
5. EVALUATION OF WORKSHOP FACILITATORS.

<table>
<thead>
<tr>
<th>ASPECT</th>
<th>Excellent</th>
<th>Good</th>
<th>Fair</th>
<th>Bad</th>
</tr>
</thead>
<tbody>
<tr>
<td>TASK TYPES</td>
<td>41%</td>
<td>53%</td>
<td>3%</td>
<td></td>
</tr>
<tr>
<td>PROCESSES</td>
<td>32%</td>
<td>53%</td>
<td>6%</td>
<td></td>
</tr>
<tr>
<td>Co-operative learning</td>
<td>56%</td>
<td>35%</td>
<td>6%</td>
<td></td>
</tr>
<tr>
<td>Sensitivity</td>
<td>26%</td>
<td>62%</td>
<td>9%</td>
<td></td>
</tr>
<tr>
<td>Clarity</td>
<td>32%</td>
<td>50%</td>
<td>15%</td>
<td></td>
</tr>
</tbody>
</table>

COLLEGE FACILITATORS' COMMENTS AND WAY FORWARD

- It is evident from the feedback received from educators that a spirit of trust is being built.

- Educators are now able to link the work done in the previous workshops with the technology workshop.

- There is a change in the attitudes of educators towards OBE.

- Group dynamics i.e. communicating ideas freely sharing successes and frustrations understanding the need for change in teaching approaches.

- Relating the work done in schools with what is being done in the broader community.

- Acquisition of skills and knowledge that will enable educators to be more innovative and original that will help them to design their own learning programmes using the policy document as a reference.

- We admire the passion and vigour with which the educators executed the different tasks and hope that they will cascade the acquired skills to their peers.

- The issue of portfolio assessment and the assessment strategies for
• The issue of portfolio assessment and the assessment strategies for technology in general will be tackled in future workshops.

• The workshop was on technology and not on MLMMS nor LLC, but these other learning areas will be dealt with in future workshops.

• Practical activities will henceforth be dealt with in the context of learning programmes and unfortunately for us to make our contribution more meaningful there will always be an element of theory.

MANCHADI MATJILA
RECTOR
REPORT ON THE ASSESSMENT WORKSHOP HELD AT TLHABANE EDUCATOR DEVELOPMENT CENTRE ON 17 AUGUST 2000:

- Educators were given an evaluation of the workshop held on 10/08/2000, and copies of the report given to all the piloting sites.
- The assessment workshop was as the result of the educator’s responses to the evaluation of OBE terminology workshop of 10/08/2000.
- The following are the responses of the educators for the assessment workshop:

  - Evaluation of college facilitators:

<table>
<thead>
<tr>
<th>Attitudes</th>
<th>GOOD</th>
<th>FAIR</th>
<th>Needs improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>95%</td>
<td>05%</td>
<td>-</td>
</tr>
<tr>
<td>Promptness</td>
<td>89%</td>
<td>8%</td>
<td>3%</td>
</tr>
<tr>
<td>Response to questions</td>
<td>79%</td>
<td>13%</td>
<td>8%</td>
</tr>
</tbody>
</table>

- Workshop facilities

<table>
<thead>
<tr>
<th></th>
<th>Excellent</th>
<th>Fair</th>
<th>No Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Venue</td>
<td>82%</td>
<td>13%</td>
<td>5%</td>
</tr>
<tr>
<td>Meals</td>
<td>79%</td>
<td>18%</td>
<td>3%</td>
</tr>
<tr>
<td>Hospitality</td>
<td>79%</td>
<td>16%</td>
<td>5%</td>
</tr>
</tbody>
</table>

*Meeting expectations
- Most educators intimated that they benefited a lot from the workshop.
- It motivated them to assess with confidence
- It gave them a better understanding of different assessment strategies.
- Activities given were practical, encouraged them to interact with each other and communicate freely.
- Challenging areas of assessment were:
• Intervention forms
• Re-assessment
• Recording charts
• Group assessment
• Design of assessment activities.

-Further training needed

• 30 educators indicated that they do not need further training on assessment.
• 4 educators had a problem with recording.
• One educator wants to know items that should be noted on the hand-book.
• One educator needs clarity on whether when using the recording chart one assesses per activity or per programme organizer.
• One educator needs clarity on portfolio assessment.

Responses to Educators’ concerns and contributions.
- Based on the responses of the educators, the assessment workshop was a success. This success implies that the college should now focus on the teaching aids workshop.
- Consolidation of the concepts and their practical applications will be done at the learning sites by educators and college learning area teams.

RECTOR:

MANCHADI MATJILA:
REPORT ON THE TEACHING AIDS WORKSHOP  24-08-2000

1. Evaluation of workshop events

<table>
<thead>
<tr>
<th></th>
<th>POOR</th>
<th>SATISFIED</th>
<th>FAIR</th>
<th>GOOD</th>
<th>EXCELLENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Papier mache</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>10</td>
<td>28</td>
</tr>
<tr>
<td>Painting &amp; Printing</td>
<td>-</td>
<td>-</td>
<td>07</td>
<td>14</td>
<td>17</td>
</tr>
<tr>
<td>Boxes and other</td>
<td>-</td>
<td>-</td>
<td>01</td>
<td>03</td>
<td>33</td>
</tr>
<tr>
<td>waste materials</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Workshop preparation

- All facilitators say that the workshop materials were relevant and lecturers were well prepared.
- A well-structured format was used for different activities.
- Activities showed that the lecturers were creative.

3. Valuable information gained from the workshop

- The versatility of paper and balloons.
- Acquisition of skills which will enable educators to make their own teaching aids using waste.
- Appreciation of the cheapest methods one can use to facilitate teaching using recyclable materials.
- Use of teaching aids for integration.
- Innovative ideas which tap creativity and allow one the freedom to express oneself.

4. Techniques to be included in future workshops

- collage
- coin printing
- drawing skills
- colour mixing
5. Workshop aspects which were irrelevant

No educator regarded any aspect as being irrelevant.

6. Integration of what has been learned into daily teaching

- Encourage learners to make aids to be used in class.
- Try to implement all aspects fully.
- Use one teaching aid for three different lessons.
- Consolidation of what has been learned with prior knowledge.
- Daily assessment.
- Be more engaging
- Change the teaching approach to try to do what is best for the learners.
- Encourage learners to learn with their own self-made aids.
- Effective use of the policy document for planning.

6. Benefit to other schools which are not part of COMETDS

- One educator says that she usually meets with other educators to capacitate them on what she has gained from the project.
- Helping other educators to design dialogue activities.
- Other schools approach COMETDS schools for advice.
  *The inputs from the three educators, as described above, illustrate the ripple effect of the project, which should benefit many schools in the long run, especially those which are clustered.
- Other educators have not yet had the opportunity to reach out to their colleagues, but this is just temporary.

7. Vigilance of facilitators

Comments range from:

- well-prepared
- excellent
- good
- relevant to needs
- active
- flexible
- friendly
8. College comments on educators' inputs

The vibrance with which the educators and facilitators executed the various tasks is commendable.

• An excellent rapport is being built by both the college and the piloting sites.

• We have reached a stage where we can say that outcomes based education is being demystified.

• We can now move into different learning areas, make policy interpretations within reach of all participants, boost the morale of educators, restore the culture of learning with the confidence that all stakeholders are sure of what is expected of them.

• It is our hope that it is now becoming clear that, to implement OBE, we need to interact with our environment, utilise it to make excellent teaching aids to facilitate learning and not depend on expensive equipment at all times.

• The inputs of the participating learning sites is valuable in making the project the success it is.

• All future workshops will be conducted in the same spirit in which the OBE Terminology and Teaching Aids workshops were.

RECTOR : Manchadi Matjila
REPORT ON THE COMEDTS TERMINOLOGY WORKSHOP HELD AT THE COLLEGE ON 10-08-2000.

*Emanating from the Situational Analysis conducted in the 10 piloting Learning sites during April-May 2000.

The first workshop was held at the College on 10-08-2000.

-The workshop focussed on OBE curriculum problems and these were:
Specific Outcomes, Range Statements, Assessment Criteria, Performance Indicators, planning of a learning experience, ASSESSMENT, Integration and general policy interpretation.

* Forty educators attended this workshop.

* Educators were given evaluation forms at the end of the session and their responses were as follows:

1. Aspects of that workshop that were helpful:
   -Terminology (100%)
   -Planning of a learning experience (75%)

2. Aspects of the workshop that are important, but were left out:
   - Assessment (84%)
   - None (2.5%)
   - Integration (5%)
   - Relevant workshop materials (8%)

3. Things to be included in future workshops:
   - Demonstration lessons
   - Class visits
   - Divulge agenda in advance
   - Help with remedial work
   - Teaching aids (design and use)
   - Extend workshops to two days
   - More practical activities
Responses to items / aspects 2 and 3

* Learner centred learning workshop to be shelved for now and a full-day workshop on assessment to be given to educators on 16-08-2000.

* Demonstration lessons with actual learners will be the responsibility of educators, together with the College learning area teams and the actual execution of these will be worked out by both parties.

* Class visits will be done when necessary.

* All site managers will be given reminders of workshops and educators will be provided with the actual workshop programme and if any documents are required, they will be informed of this in advance.

* There will be a two-day workshop on the design and use of teaching aids Using recyclable materials during the week beginning 21-08-2000.

* Site managers, educator representatives, SGB representatives and the College implementation team agreed on one-day workshops to minimise the number of days that educators are away from their schools.

* In future, we will ensure that we do not do too much in one day, but rather plan school-based follow-up sessions.

* Future workshops will focus on more practical activities with limited theory, to help educators in their work.

Report compiled by
M. J. KATANE
1.7.1 The Research Questionnaires:

The questionnaires will be administered to the teachers at the school bases. Appointments have been made with respective principals to administer the questionnaires 10 minutes before the end of the day (See Appendix A: Questionnaire schedule for teachers). The principals have agreed to collect the questionnaires and submit them to the researcher within a week of the appointment.

With regard to the Higher Education Diploma teachers, the lecturers have agreed to administer the questionnaires on behalf of the researcher. This will be done after a lecture on the day of the appointment. (See Appendix B: Questionnaires for HED educators).

Personal appointments will be made with the lectures for individual interviews. A letter has been written to the college Rector to give the researcher permission to interview the lecturers (See Appendix C: Letter written to the Rector and interview schedule for lecturers).

The time, place and conditions of the interview will be decided. A tape recorder will be used to enhance the interviews. Responses will be later transcribed. This approach will speed up and properly record responses (Gay 1981).

1.7.2 Research Respondents.

All research subjects were selected from the Rustenburg District in the North-West. The research subject for this study comprise of 10 primary schools teachers, 40 Higher Education Diploma (Environmental Education) teachers and four (4) Lecturers lecturing at Mangkoe Christian College (Higher Diploma in Environmental Education).

These subjects were chosen given their position and knowledge of EE. They are also
QUALIFICATIONS
EDUCATORS

88 EDUCATORS INVOLVED IN SITUATIONAL ANALYSIS
Appendix G

A Summary of responses on questionnaires administered to teachers in the Rustenburg District on Outcomes-Based Education and Environmental Education.

Number of questionnaires issued: 87. Number of questionnaires returned 73

1. Personal information

1. Are you a teacher?
   Yes: 73
   No: 00

2. How long have you been teaching?
   >5: 18
   10: 07
   >10: 21
   >20: 27

3. For how long have you had your teaching qualification?
   >1: 00
   >5: 17
   >10: 28
   >20: 28

4. Have you had any training on OBE?
   Yes: 67
   No: 06

5. Have you had any training in environmental education or studies?
   Yes: 42
   No: 33

6. What is the level of development around your school?
   Urban: 23
   Rural: 44
   Farm: 06
2. Questionnaire related to Environmental Education

1. Are you familiar with the concept environmental education?
   Yes: 60
   No: 12

2. Do you understand the definition of the concept mentioned in 1. above?
   Yes: 61
   No: 11

3. Are you familiar with the aims and objectives of the concept mentioned in 1.
   Yes: 5
   No: 17

4. Have you taught environmental education or environmental studies?
   Yes: 42
   No: 30

5. Are you familiar with the principles (key aspects) of environmental education
   Yes: 38
   No: 29

6. Do you think that environmental education should be taught as an independent subject?
   Yes: 47
   No: 24

7. Do you agree with the thinking that knowledge should be integrated, i.e. should be holistic?
   Yes: 69
   No: 03

8. Do you agree that teaching should integrate knowledge?
   Yes: 60
   No: 03

9. Does Environmental education contribute to the establishment of sound values within learners?
   Yes: 69
   No: 03

10. Does environmental education contribute to the development of skills such as critical thinking, decision making, investigation and analysis?
    Yes: 9
    No: 03
11. Does your school have any environmental project?
   Yes: 37
   No: 34

3. **Environmental Education approaches and methods in Outcomes-based education.**

1. Have you been using OBE in your teaching?
   Yes: 64
   No: 08

2. Do you agree with the approaches used?
   Yes: 58
   No: 04

3. Does integration of knowledge as proposed by OBE and environmental education add value to your teaching?
   Yes: 59
   No: 13

4. Are you familiar with cross curricular approach?
   Yes: 59
   No: 13

5. Are you also familiar with interdisciplinary approach?
   Yes: 58
   No: 14

6. Do you apply these approaches, mentioned in 1. And 2, in your teaching?
   Yes: 55
   No: 07

7. Do you agree with the opinion that all learning areas should be taught from an integrated interdisciplinary perspective?
   Yes: 70
   No: 02

8. Do you find it possible to teach environmental education from a variety of learning areas?
   Yes: 61
   No: 11
9. Has the introduction of environment as a phase organizer in C2005 made integration of knowledge possible?
Yes: 67
No: 05

10. Are you familiar with the critical and specific outcomes in C2005 that are relevant to environmental education?
Yes: 61
No: 11

3. A summary of the written comments is presented comments from all 72 questionnaires.

11. Can you mention some of the methods (e.g. project method) used in OBE?
Discovery
Discussion
Question and answer
Interview
Researches
Group work
Experiments
Field methods
Hands on experience
Participative method
Eclectic
Making models
Identification method
Observation methods
Drama
Survey
Debate
Team teaching and Learning
Child centered methods
Action competence approaches
Drama

12. Can you mention some of the methods used in environmental education?
Discovery
Field Trips
Excursions
Project
Research
Experiments
Use of school grounds
Participative methods
Eclectic
Exploratory methods
Practical demonstrations
Story telling
Solitaire

13. Do you think that there is a significant difference between the approaches used in OBE and environmental education? (If yes or no explain)

No. Same methods are applied
No. Learners are highly involved
No. They are all child centered and self exploratory
EE and OBE are related and environment is a phase organizer
No difference
No both encourage practical experience
I don't know, I have not attended EE
I have not attended training on EE so I don't know the difference
No. Because methods are integrated and the same
No. Both use same approaches and methods
No. They both integrate knowledge
No. Both in OBE and EE learners are responsible for their learning
EE and OBE have the same objectives or outcomes
No. They have the same philosophical and pedagogical approaches
No. They are more or less working together
No. Both emphasize practical experience
No. They are all learner centered
No. They are all outcomes based
No they are closely related. OBE emphasizes integration of knowledge and that is exactly what EE is about
I do not know

14. May you list problems (if any) in the proper implementation of OBE in general and C2005 in particular?

There are no problems as such, teachers don't have the courage to implement OBE.
Educators complain about material and terminology.
Planning of learning experience
Teachers are not familiar with the concepts used
Some of the slow learners lack behind
Written work is horrible
Too much paper work for the teacher
Training for teachers not enough
Lack of resources
Educators not familiar with the approach
Overcrowding
Theoretical work is sacrificed
Finance
Illiterate parents who can't make an input in the education of their children
Different information about OBE
Lack of support from the employer
In appropriate teacher training and orientation

15. May you list problems (if any) in the application of environmental education approaches in OBE and C2005.

- Lazy learners become passive
- Parents are not familiar with the new approaches
- Terminology
- Lack of knowledge
- Negative attitude of educators
- No relevant material resources
- There is always danger in Field trips
- There are no problems at all - they share the same goals
- Some educators may use EE as an excuse to take learners out of class
- Lack of knowledge of EE by educators

16. How do you suggest problems (if any) mentioned in 14. and 15. Should be addressed?

- Workshops and follow ups
- Learners ability should be considered for promotion
- Terms should be simplified
- Paper work reduced
- School environment policy should be developed
- Empowerment of educators in EE is advised
- Provisioning of more resources is important
- Creation of posts
- By re looking at resource allocation
- Teachers must study and research on their own

17. Would you like to make any other comment regarding Environmental education in OBE?

- EE must be included in the curriculum
- EE must be taken very seriously because it affects all life
- Parents should be enlightened
- EE and OBE should further be integrated
- I think educators should be given more training on environmental issues and approaches and how EE relates to OBE
There is good integration between EE and OBE
Yes. There should be more focus on Environment
EE must be included in the curriculum
This is a break through, they agree closely
This is an opportune time for EE to be integrated into the curriculum
EE must be included in the curriculum as it is involving and participative
This is a success
EE should be implemented so as to make children aware of natural resources and how essential they are to life in general
EE links the school, home and community
EE should be taught in an integrated manner rather than as a separate subject due to the overloaded curriculum. It should be like spice to food.

19. Would you like to have more documentation about OBE and environmental education approaches and methods?

Yes. This will give people direction and information.
Yes. That will be helpful
Yes. Most problems will be overcome in terms of implementation
Yes. Because material on EE is very limited
Yes. It will provide more insight on the approaches and methods
Yes. Kindly arrange for a cluster workshop on EE and OBE
Yes. We still need information on these two aspects