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**HOW TEACHERS
INTEGRATE
ENVIRONMENTAL EDUCATION
INTO THE
CURRICULUM**

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ABSTRACT

The purpose of the research was to determine how teachers integrate environmental education into the curriculum.

In achieving this, the research set out to document answers to the following critical research questions:

- What are the different ways in which teachers integrate environmental education into the curriculum?
- How do teachers explain their particular strategies for integration?
- To what extent does the resources context influence the ways in which teachers integrate environmental education into the curriculum?

A survey was carried out in schools from the North Durban and South Durban Regions of KwaZulu-Natal, South Africa, who attended a workshop at the Durban environmental education centre.

A questionnaire was administered to all the teachers who attended the workshop, followed by observations and a semi-structured post observation interview was held with a select sample of the teachers. All focused on documenting curriculum integration strategies with regard environmental education.

The literature review revealed some strategies to integrate environmental education into the curriculum and highlighted some of the problems associated with the integration of environmental education into the curriculum.

Data obtained, revealed that teachers are integrating environmental education into the curriculum using a variety of strategies and topics. The availability of resources does affect the extent to which environmental aspects are included, but this does not appear to be the only limitation to integrate environmental education into the curriculum

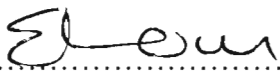
To Rupert, Rudi and Ruaan

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without which this research would not have been possible.

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took part in this research.

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this study would not have been possible.

I, Erika René Lerm, declare
that this dissertation is my own work,
and has not been submitted previously for any degree at any university.


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CHAPTER 1

THE RESEARCH AREA

1. Introduction

“Environmental education is a field characterised by a paradox: whilst few would doubt the urgency and importance of learning to live in sustainable ways, environmental education holds nowhere near the priority position in formal schooling around the world that this would suggest. (Joy A. Palmer, 1998)

This holds true in the South African context where environmental education has historically been neglected in the school curriculum. In recent years, the new State curriculum has affirmed the importance of environmental education. It is important therefore to understand how teachers view environmental education.

Environmental education is a very broad concept that could refer to the social, astrological, natural, social and political environment. It is with this in mind that my research will touch on the philosophical pillars on which environmental education rests. The main focus is however on **how** teachers make it happen in the classroom. This in itself will be influenced by the perception teachers' have of environmental education. The way, in which **they** interpret environmental education, will determine the strategies they use. It is this aspect on which the research will focus. An underlying focus of the research is on the relationship between teachers' conception of environmental education and their curriculum integration strategies.

My research will also attempt to find reasons for teachers using certain strategies. The factors that may affect their choices will be identified. I hope that the research will shed light as to the extent to which the resources context affects the ways in which teachers integrate environmental education into the curriculum

2. Purpose of the research

This research sets out to examine the ways in which teachers integrate environmental education into the curriculum

A survey was carried out in all the primary schools in the North Durban Region, in the province of KwaZulu-Natal, whose teachers attended a workshop at the Durban Environmental Education Centre. I administered a questionnaire to all the teachers, followed by observations and interviews with a select sample of the teachers. All focused on documenting curriculum integration strategies with regard to environmental education.

3. Critical questions

To enable me to establish the above, the research will centre on answering the following critical questions:

1. What are the different ways in which teachers integrate environmental education into the curriculum?
2. How do teachers explain their particular strategies for integrating environmental education into the curriculum?

3. To what extent does the resource context influence the ways in which teachers integrate environmental education into the curriculum?

4. Rationale for the research

As stated, environmental education has been historically neglected and does not form part of the formal curriculum. This research will enable me to enter into the debate of integration, and it is hoped that the strategies identified will assist teachers in their efforts to integrate environmental education into their curriculum.

5. Significance of this study

This research would inform:

a) The broader teacher population on:

- The ways in which environmental education can be integrated into the current curriculum.
- The use and value of environmental education materials.
- How to design integrated learning programmes.

b) The existing research on how teachers, especially in the under-resourced contexts of developing countries, use environmental education in their classrooms.

6. Methodology

The sample chosen for the research consisted of primary school educators from the Durban area in KwaZulu-Natal, one of the provinces in South Africa. I have combined both qualitative and quantitative methods of data collection for this study. Data was collected using the following instruments: questionnaires, transcript analysis, interviews, observation schedules, researcher's diary, teachers' diaries, in order to answer each of the following three critical research questions.

Critical Question One

**What are the different ways in which teachers integrate?
environmental education into the curriculum?**

I sent questionnaires (Appendix A) containing only closed-ended questions to **60** primary school teachers from the greater Durban area of KwaZulu-Natal, who attended **an** environmental education workshop that was held at the Durban environmental education centre.

The questionnaire was used to determine the following:

- Whether environmental education was being integrated into the curriculum.
- Which topics were covered?
- What materials were used?
- Strategies used to incorporate an environmental topic.
- The kinds of resources available to teachers in the school, to enable me to draw up a resources profile.
- Support of management.

To increase the validity of the questionnaire, it was informally administered to a group of colleagues and educators. They were asked to comment on any aspect of the questionnaire as a whole and to suggest how the questionnaire could be improved. The purpose of the research and the role of the questionnaire therein were explained. After their responses were received, items were rephrased to ensure greater clarity and to prevent uncertainty.

Critical Question 2

How do teachers explain their particular strategies for integrating environmental education into the curriculum?

A semi-structured, post observation interview (Appendix B) was held with the four teachers observed, and transcribed, to find out why they selected certain materials and to explain why they used materials in a particular way. The lessons, observed were tape-recorded, and an observation schedule (Appendix C) completed for each lesson observed.

Critical Question Three

To what extent does the resources context influence the ways in which teachers integrate environmental education into the curriculum?

Of the four teachers selected, two were from a moderately resourced school and two were from a well-resourced school. The information from the questionnaires and prior knowledge of the schools, helped in the selection of the two schools.

The following criteria were used to select the teachers:

- Junior primary teacher, from a moderately resourced school, where teaching is integrated.
- Junior primary teacher, from a well resourced school, where teaching is integrated.
- Senior primary teacher from a moderately resourced school and
- Senior primary teacher from a well-resourced school.

The questionnaire, supported by the observation schedule completed for each observation made, was used to answer this critical research question.

In support of the above instruments, teachers were requested to keep a diary for one week, as one or two observation sessions would not be sufficient to conclusively answer the research question. Of the four teachers, two returned their diaries, one of which was a summary of the various topics they do in Environmental studies, into which environmental issues are included.

7. Limitations of the study

The data is limited in that the research was limited to educators from primary schools, in the Province of KwaZulu-Natal. It cannot be assumed that what works in one school will necessarily work in another school. Findings cannot be generalised.

8. Preview of chapters to follow

Chapter two deals with the literature review. The literature review sets out to:

- (1) Clarify terminology and build a logical conceptual framework.
- (2) Identify strategies used in integrating environmental education into the curriculum.

- (3) Identify the kinds of materials used and how they are used.
- (4) Examine the context within which these materials and strategies are used.
- (5) Identify research theories that will inform my research.

Chapter three gives a detailed description of the methodology and data collection procedures used in my research. Problems encountered are mentioned and protocol outlined.

Chapter four presents the data obtained as case studies. The questionnaires, observation schedules and transcripts of interviews were used to present the cases of the four teachers.

Where chapter four tends to identify methods and strategies, chapter five is a cross case analysis that sets out to explain trends when integrating environmental education into the curriculum and find suitable explanations for these. Such strategies are described and the extent to which the availability of resources or lack thereof, influenced the use of such strategies explained.

Chapter six looks at all the evidence and provides an answer to the research question under scrutiny.

9. Summary

This chapter set out to outline the critical research questions and to elaborate on the purpose of the study. It was noted that environmental education is an area of schooling that is neglected.

To place this research of mine in a broader context, the next chapter will deal with literature that will look at both National and International trends in environmental education. In addition, a conceptual framework is presented to clarify concepts that are related to environmental education.

CHAPTER 2

ENVIRONMENTAL EDUCATION: A strategy to make education relevant.

1. Introduction

The relationship of humans with their environment is described by Willard et al (1976), as

- using ecosystems.
- affecting ecosystems.
- being affected by ecosystems.
- existing in complex interactions with ecosystems and
- ultimately as being accountable for their effects on ecosystems. (Heimlich 1992).

Boulding and Senesh, 1983 describe it as *dominion*, humans over nature, *stewardship*, and humans caring for nature and thirdly *union*, where humans are a part of nature. (Heimlich 1992).

Environmental degradation, overpopulation, soil erosion and pesticide poisoning are a few reasons why the introduction of environmental education into the formal curriculum has become necessary. (Naidoo, Kruger & Brookes 1990). Historic views of water and air were that they were an abundant resource and the vastness of these resources allowed for unlimited use and abuse (Trisler 1993). Additionally to-day we have chemical burdens. There has further been an added realisation that human actions affect the environment (Trisler 1993).

In South Africa, only a few of the traditional education departments, prior to the first democratic elections in 1994, such as the Natal Education Department, encouraged the teaching of environmental education across the curriculum. There are three departmental environmental education centres in the Province of KwaZulu-Natal, which organised workshops for teachers to promote such a cross-curricular approach.

It would appear that the Government of the day has identified environmental education to be one of its priorities. The constitution mentions the right of all citizens to enjoy a healthy environment. This message was re-enforced by the White Paper on Education and Training (1995) and subsequent RDP (Reconstruction and Development Programme) documents. An extract of the White Paper explains it well.

Environmental education, involving an inter-disciplinary, integrated and active approach to learning, must be a vital element of all levels and programmes of the education 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 life through the sustainable use of resources. (South Africa 1995).

How it was to be done was not clear.

Nationally the EEPI (Environmental Education Policy Initiative) was launched in 1993 by a group of formal educationists.

In KwaZulu-Natal, a framework document was submitted to CHED (Heads of ex-Education Departments) in 1996, which included a two-year plan for developing education policy for environmental education. This was approved in early 1997. The next step was to form an Environmental Education Curriculum Framework (EECF).

The EECF was launched on the 5th of June 1996 and consisted of any interested parties ranging from non-governmental officials, departmental officials, teachers and teacher unions. The various partners of the EECF developed a “basket full of resources” for teachers to use. This “basket” also contains guidelines to assist schools in developing an environmental education policy for their school.

Whereas previous initiatives, prior to the seventies was *about* the environment, during the seventies it was *in* the environment and in the eighties and nineties the emphasis is *for* the environment.

The goal of this chapter is to present a critical view of existing literature pertaining to environmental education. In so doing I will (1) clarify relevant terminology and present a conceptual framework that will organise the many concepts. In addition to this (2) a short historical view of its development is given, (3) outlines the perspectives of environmental education, (4) refers to some limitations of the formal curriculum using science as an example, (5) give reasons for the inclusion of environmental education, (6) focuses on the implementation of an environmentally enriched curriculum (7) will highlight a few problems associated with the integration of environmental education and (8) mentions the implications of the literature review for this study are mentioned.

2. Why teach environmental education?

‘The *World Conservation Strategy* links education to attitudes and behaviour:

Environmental education has the task of transforming the attitudes and behaviour of entire societies if a new conservation ethic embracing plants and animals as well as people is to become a reality” (ICCE 1984)

The reasons for introducing environmental education into the formal curriculum can be summarised under the following headings:

Knowledge: to assist people in gaining a variety of experiences in, and acquiring of the basic understanding of the environment and its related problems. It provides pupils with knowledge and skills that they need to make informed decisions on environmental issues.

Awareness: to create an awareness and sensitivity to the total environment and its many problems.

Attitudes: to develop a set of values and feelings of concern for the environment and the motivation to actively take part in the improvement and protection of the environment.

Skills: to acquire the necessary skills to identify and solve environmental problems.

Participation: to create an opportunity for pupils to become actively involved at all levels in working toward solving environmental problems. (Camozzi 1994)

3. Conceptual framework

3.1 Terminology

The research question under scrutiny is how teachers integrate environmental education into the curriculum.

The focus of this section is to clarify relevant terminology and build a logical conceptual framework. Various terminologies have been used to describe the interaction humans have with their environment.

In developing a conceptual framework a point of departure would be to look at concepts such as environment, education and integration. These will be looked at in relation to other terms such as conservation education, outdoor education and environmental literacy.

Another aspect is to look at the nature of environmental education and how it may bring about change in teaching and learning.

As a theoretical underpinning, I will be looking at the work of Palmer in which reference is made to the work of Stevenson, Gough, Robottom and Hart and Skolimowski in which they suggest a paradigm shift from the positivist outlook on research in environmental education to an interpretative paradigm.

Defining environmental education is problematic. There is no concise definition that could fully explain what it is and what it does. It is an all-embracing concept. It is necessary to recognise that an environmental dimension can be found in most aspects of education.

It is probably the best to describe environmental education as an approach to education that incorporates considerations of the environment, rather than being a separate part of education (Palmer and Neal 1994).

To clarify what is meant with environmental education it is necessary to look at the term *Environment* and how this relates to *environmental literacy* and *outdoor education*.

Encarta describes *Environment* as “the thin layer of life supports called the biosphere, including the earth’s air, soil, water and living organisms.”

Environmental literacy was a term toyed with by Charles E. Roth since 1968 (Disinger, Roth & Charles 1992). It however lacked a precise definition. The earliest use of the word *literacy* was the ability to read and write. It has a distinct plural notion in that various literacies are referred to, such as mathematical literacy, computer literacy, cultural literacy to name a few. All of these suggest an integration of ways of thinking, talking, interacting and valuing in addition to reading and writing. Literacy is thus less about reading and writing but rather ways of making meaning with and around text. Most of the literacies are defined in cognitive terms. Knowledge is a necessary requirement for thoughtful behaviour and action.

Since the conception of the term, a distinguishing characteristic of it has been its *action* perspective. If a concise definition was possible, the following one will suffice: “It is the capacity to perceive and interpret the relative health of environmental systems and take appropriate action to maintain, restore or improve the health of those systems”. (Disinger, Roth & Charles 1992).

Looking at the concepts *environment* and *environmental literacy* the question arises how this relates to *environmental education*?

Disinger, Roth & Charles (1992) stated that the goal of environmental education is to create environmental literacy.

The definition for environmental education, suggested by the Environmental Education Policy Initiative (EEPI), 1994 based on their view of the environment, is that it does not only refer to nature or nature conservation but acknowledges that economic and social decisions have direct impact on the environment and on the quality of people's lives. Keeping this in mind they see environmental education as developing the necessary knowledge, understanding, values, skills and commitment to allow people to be pro-active in securing a healthy and properly functioning environment that is sustainable. This being true for the local environment, regional and global environments.

One single definition to describe environmental education at this stage is premature. It is necessary to follow the development of the concept over time.

3.2 Historical development

Environmental education seems to have had its origins with the American philosopher and naturalist, Henry David Thoreau, naturalists John Burroughs, John Muir and Ernst Thompson Seton.

Since 1900 and 1930 it was referred to as *nature study* in primary (elementary schools). It involved the study of the atmosphere, earth, plants and animals. The

major objective was to develop sympathy for and knowledge of nature and the environment. (Encarta 1996)

During the 1940's, nature study became *conservation education*. The emphasis being on caring and managing soil, forests, water and grasslands. It had a similar objective in that it was concerned with developing an appreciation and understanding of the importance of natural resources for individual well-being.

Due to increased urbanisation, conservation education made way for *outdoor education* in the 1960's. It involved classrooms in the field and was an attempt to cultivate an appreciation and knowledge of the natural world in pupils.

In the 1970's, outdoor education was put aside to make way for *environmental education*. Environmental education had the following vision:

- (1) to draw the attention of humans to the impact they had on their environment and
- (2) to incorporate environmental problems into other courses rather than to teach it as a separate subject.

Many courses and curricula in environmental studies (as it was known) began appearing in universities and colleges. Environmental education involved the studying of trade books on the subject, new environmental magazines and environmental sections in newspapers and magazines. It also involved attending short courses, seminars, field trips and meetings.

It remains difficult to define, due to its multidisciplinary and interdisciplinary nature. It could mean concepts in ecology, outdoor education, environmental science or instruction about issues. (Trisler 1993).

It is a process of moving individuals towards stewardship and ultimately a union view of pupils' relationship with nature (Heimlich 1992).

Care must be taken not to merely list environmental facts in a logical sequence as this goes against the concept that the world and environment is a whole and interconnected. (Carozzi 1994). Therefore through such a reductionist approach of placing various aspects in little compartments so that we can understand the parts of the whole, the essence of the concept may be lost.

There is still no consensus among educationists and environmentalists what environmental education constitutes. For the purposes of this research the definition of the Environmental Education Policy Initiative (EEPI) where environmental education is viewed as a broad concept and not only referring to nature and natural things, will be used.

4. Perspectives of environmental education – A short survey

The literature reveals that environmental education is an area that has been neglected for centuries. It is only as recently as 1990 that the National Environmental Education Act was passed in the United States of America, one of the countries to be seen as a leader in the field. The aim of the act was to (1) educate the youth, (2) encourage partnerships and (3) build upon long-standing environmental education efforts among Federal Agencies, local Education Institutes, State Agencies, Non-profit Organisations and the Private Sector.

This was carried out by the Education Division of the EPA (Environmental Protection Agency).

They were eager to promote quality environmental education programmes. The NAAEE (North American Association for Environmental Education) are responsible for developing standards for environmental education materials.

This will help ensure the best programmes and curricula are used by educators. (Environment and Education 1997).

Environmental education is defined in the United States in four ways: (1) it includes a human component in the investigations of environmental problems, (2) it's foundation is knowledge about social and ecological systems, (3) it includes the affective domain of attitudes, values and commitment and (4) it includes the opportunity to build skills and enhance pupils' problem solving abilities. (NEEAP 1997).

In Britain, due to the diversity within the education system, there is great variation in commitment when it comes to the integration of environmental education. Some schools are well equipped and have allotted staff that look after the interests of environmental education in the school. Due to some schools following a rigid timetable environmental education is restricted to discussions within the science lessons. (Martin & Wheeler 1975).

A conference was held in 1979 in the People's Republic of China on environmental education. It was at this conference that it was recommended that environmental education be introduced in primary and secondary schools. They identified several schools in the various provinces and ran a pilot project. In 1993, contents of environmental education were included in the

teaching materials. Environmental education at this point in time has become a discipline in basic education. In addition to narratives they make use of problem solving, experimentation, field studies and simulations as approaches in the teaching of environmental education.(Palmer 1998).

An international debate that took place in Greece in the 1970s about the need for environmental education had an effect on the education department. During the early stages of introducing environmental education, it took on the form of infusing basic ecological concepts in subjects such as science.

The official introduction of environmental education came with the training of about 30 Greek teachers by European experts in 1980. This resulted in the Ministry of Education organising a series of training seminars in different parts of the country.

Although the introduction of environmental education has gone well in Greece, their education system is very centralised and compartmentalised, which does not allow much space for inter-disciplinary projects. This creates problems for the teachers when trying to integrate environmental education within an unyielding timetable.

In 1990 a law was passed that recognises environmental education as being part of the primary and secondary school curricula in Greece.

Environmental education is a global issue. Global is defined as the impact of an individual or group's actions on other societies. We are all part of this global village and to ensure the prosperity of the environment it is important that all countries introduce environmental

education into their formal education systems so that pupils can be equipped with the necessary knowledge and skills so that they can make responsible and informed choices about the environment.

This section set out to show when and how environmental education was introduced in various countries.

5. Limitations of formal curricula: Science an example

This section will pose to identify the gaps that exist in the formal curricula, which can be filled by the inclusion of environmental education.

The nature of science education is that it is entrenched in a logical, positivist tradition, emphasising objectivity in observation, consistency in experimentation, precision in measurement and logical interpretation of results against the structures of hypotheses, laws and theory. (Best, 1994). Mays (1985) describes scientific thinking as hypothesising, logical thinking and analysing variables. She makes reference to research that looked into how children develop their abilities as scientists. What was significant from the research was that the child's interaction with his environment was important. Knowledge is truly built up from experience and experience from the environment.

Naidoo, Kruger and Brookes (1990), would argue that the present classroom scenarios range from being discipline bound and engaging in uncritical, transmissive teacher practices aimed towards cognitive development and behaviour manipulation of pupils by encouraging rote learning

Courses are structured and have rigid boundaries. Each subject is taught in its own separate compartment. This stifles the introduction of problem solving techniques.

6. The case for integrating environmental education into the formal curriculum

This section will focus on the reasons for implementing Environmental education.

One important aspect is that it is a global issue. Global being defined as “the action of an individual or society that has an impact on other societies”. (Trisler 1993). Examples of global issues would include airborne toxins, ozone depletion and solid waste management.

Every human activity has an impact on the environment both immediately and globally.

Hinnes et al (1987) states four factors, which forms environmental education.

- Knowledge of environmental issues,
- Knowledge of specific action strategies to apply to the issues,
- The ability to take action on environmental issues and
- Ownership of certain affective and personality attributes. (Heimlich 1992)

Ramsey and Hungerford (1989) believe the primary goal of environmental education is to develop responsible environmental behaviour in citizens both as individuals and as a societal group.

Formal education systems in many instances have curricula that are not relevant to the context from which learners come. Nor do they sensitise and demand action from learners with regard environmental issues. Traditionally it is the general science teacher or biology teacher who incorporates some element of the environment into their lessons.

In the South African context there has been no formal inclusion of environmental education into the syllabus. It happens incidentally if a topic lends itself to inclusion. It is only now with the introduction of the new outcomes based model of education (Curriculum 2005), that an attempt is being made to introduce it formally into the curriculum. The traditional curricula are so overindulged with content and being an exam driven curriculum, the teacher does not have the flexibility of time to indulge in environmental issues.

One of the foremost reasons for introducing environmental education into the curriculum is to develop environmental literacy in learners. Environmental literacy has different meanings to different people.(Environment & Education 1997). Environmental literacy would enable learners to evaluate information, choose alternatives, advocate action and take action to sustain and enhance a healthy environment. (Disinger, Roth & Charles 1992). It is to develop responsible behaviour and improve environmental quality. It can be seen as an investment as to-days students are tomorrow's leaders and decision makers. For Ramsey and Hungerford, 1989, it involves the acquiring of knowledge, development of analytical skills, developing an environmentally conscious attitude and ultimately responsible behaviour.(Trisler 1993).

In summary the inclusion of environmental education into the formal curriculum enables teachers effective ways to make lessons cross curricular and more meaningful.

It creates the opportunity to teach problem solving skills and a way for students to explore attitudes and values.

It allows teachers to make use of a variety of teaching methods in which pupils can engage in different learning styles by using outdoor adventures and hands-on activities.

It provides teachers with the opportunity to make use of local community resources and in this way pupils get to know their local community better.

Lastly it affords teachers the opportunity to integrate principles of education reform such as multicultural education and cooperative learning .

7. How to integrate Environmental Education into the Formal Curriculum

7.1 Introduction

The constraints that were outlined previously need to be overcome by developing strategies for curriculum development, implementation and evaluation.

The teaching of environmental education cannot be left to chance. It needs careful planning. This section will set out to give three different philosophies on how it can be integrated and strategies outlined as revealed through the literature.

7.2 Philosophical Underpinnings – Promoting a concern for the environment.

To examine the ways in which environmental education is integrated into the curriculum, three philosophical positions need to be considered:

- Imposition – this would entail the adding on to the study a subject called environment or a specific focus within the environment. There are a lot of materials available for specific topics. As it is most readily available, it is very simple to introduce it into a lesson. The problem with this is that a lot of the material address topics in isolation and is not always suitable.

- Infusion – involves the inclusion of environmental concerns into existing curricula and content. Content and skills are integrated in such a way as not to lose the integrity of the course itself (Ramsey, Hungerford and Volt 1992) and (Trisler 93). The educator faces the challenge of how to infiltrate the learning experience with environmental education (Smith 1987) and (Heimlich 1992). It may be thematic for a class or a group.

In many instances it is about creating the opportunities to include environmental issues as application to the field of study. This is mostly seen in primary schools and in a lesser extent in high schools, as classes are more departmentalised and topically related. (Singelray 1991) and (Trisler 1993).

Resources are available that provide teachers with activities that will incorporate environmental topics or themes into traditional disciplinary approaches. This approach sets out to integrate the knowledge, skills, attitudes, experiences and commitment that will result in informed decisions, responsible behaviour and constructive actions.(Heimlich 1992). It can be done in all subjects.

- Framing – this way suggests that the illogical boundaries of traditional disciplines be eliminated in lieu of creating a framework of study in which subject areas become related and integrated rather than isolated and disparate. (Heimlich, 1992). This approach frames learning in a manner that challenges old assumptions about teaching and learning. (Heimlich 1992). Framing learning for environmental education requires moving beyond traditional methods of classroom teaching. (Rubba, 1987).

Just as with environmental issues, there is no uniformity on how to best introduce and use environmental issues in the teaching and learning process.

There is not only one right way.

7.3 Towards an Environmentally Enriched Curriculum

There is a need for an alternative curriculum where pupils engage in problem solving in the environment. According to Pillay and Naidoo (1990), this is not happening in the majority of South African schools. Teachers are engaging in a transmissive mode of teaching and meaningful learning occurs to a limited extent. Their research indicates that a collaborative participatory approach to curriculum development within an action research framework by teachers is needed to produce a relevant curriculum (Pillay and Naidoo 1990).

Integration in this instance refers to the inclusion of environmental issues, either interdisciplinary or cross-curricular as a theme or topic. The literature reveals that education regarding the environment includes three aspects (Corsen 1978), (Fien 1991), and Goodall (1994), mention three distinct ways in which science and other subjects draw from, and use the environment (figure 1).

- Education **for** the environment sets out to develop a concern for the environment. This goes beyond gaining knowledge of the environment. The knowledge and skills gained are used to change behaviour through the values that are formed (Palmer and Neal 1994). Whereas Corsen (1978) sees it as science providing the methodology to approach the environmental problems and aspects of the environment.
- Education **through** or **in** the environment, where the environment is used as a resource whereby learners engage in discovery learning.
- Education **about** the environment seeks to discover the nature of the area to be studied. This occurs mainly through investigative and discovery approaches. It is cognitive in nature and is concerned with gaining

information regarding the environment (Palmer and Neal 1994). Corsen (1978) sees it as using basic concepts to study and understand the environment.

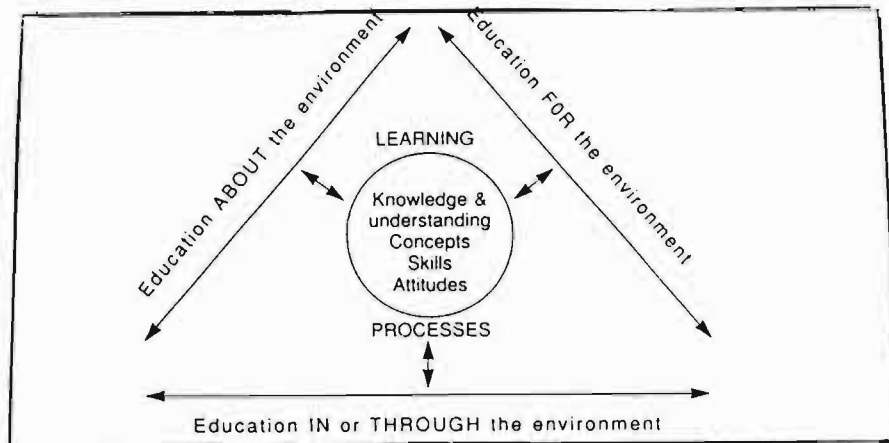


Figure 1 - Interrelated components of environmental education (Palmer 1998)

In summary the relationship that exists between subject areas and environmental education, is a symbiotic one. Elements and issues in the environment are used to enrich and give a different dimension to subject areas and the subject areas in return, are used to explain environmental issues and provide academic explanations and solutions to problems.

Therefore even though the subject area is taught through the environment as a resource, the opportunity is created to change the minds and attitudes of learners towards the environment.

7.3.1 Planning Tool for Integrating Environmental education into the Formal Curriculum: An example

A tool (figure 2) to use in planning such an integrated curriculum, brings together the knowledge, skills and attitudes central to:

- Education about the environment
- Education for the environment
- Education through the environment

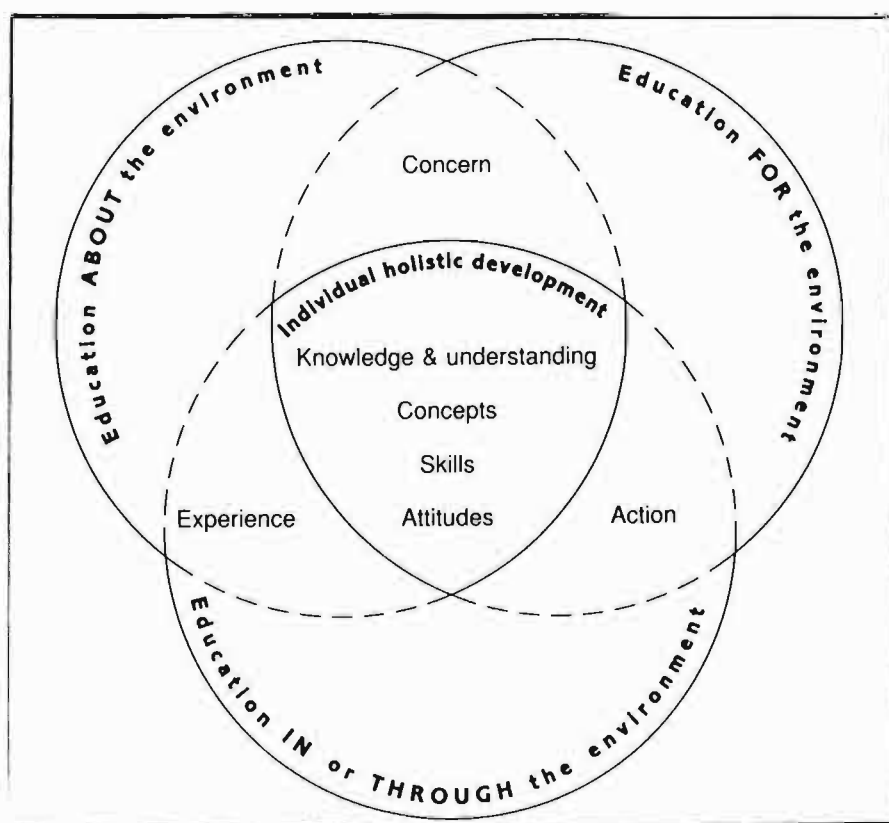


Figure 2 - Planning Tool (Palmer 1998)

Example: Prevention and control of litter

This topic can be used to deal with the kinds of mathematical skills learners need in various subjects. They could engage in:

counting, estimation, proportion, area, scale, density, weight, volume, costs and statistics. This information can lead to the designing of block graphs, histograms, pie charts, surveying and mapping exercises.

Learners can do a survey of various areas of the school on certain days

at certain times and see whether there is some kind of correlation.
Examples could include the corridors, playground, classrooms, playing fields, foyer, entrance gates, bus stop and tuck shop.

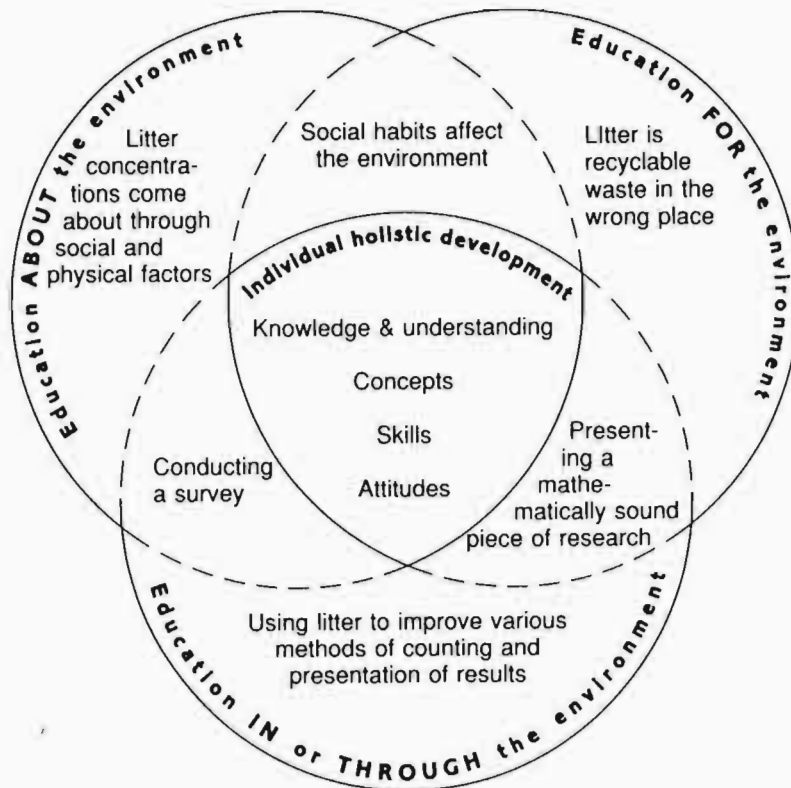


Figure 3 - Educational programme on litter
(Palmer 1998)

From the model in figure 3 the following knowledge, content and skills are learnt

Knowledge and content

Education *about* the environment

- litter concentrations come about through social and physical factors
- social habits affect the environment

Education *for* the environment

- Litter is recyclable waste in the wrong place.

Education *through* or *in* the environment

- Using litter to improve various methods of counting and presentation of results

Skills

- Conducting a survey
- Presenting findings in graphs
- Interpreting data

7.3.2 Aspects to consider when integrating environmental education into the formal curriculum

Considering the nature of environmental education the following aspects need to be considered when integrating environmental education into the formal curriculum.

- It is cross-curricular in approach.
- As a theme it should not be merely added to the core science subject but should form a central element of the curriculum as a whole.
- It should be based on experiential learning and field work.
- The environment should be taught in a holistic manner and not as separate entities
- Encourage collaborative work
- Include problem solving and decision making exercises
- It is not a subject but a curriculum area - it involves a different approach

7. 4 What are the problems associated with integration?

There are a variety of factors that hampers the integration of environmental education into the formal curriculum.

The exact same factors that were described as shortcomings in the formal curricula are the ones presenting a problem when it comes to integrating environmental education into the curriculum.

The curriculum as it is at present is rigid and inflexible. Courses are descriptive and structured into the various disciplines. This makes it difficult to teach interdisciplinary and develop problem-solving skills.

Subjects are crowded with subject matter, which places the teacher under tremendous pressure to complete the syllabus. There is just no time to fit in environmental issues into just a jam-packed syllabus.

A lack of guidance about cross-curricular themes and the lack of reinforcement by parents and the community is another problem associated with successful implementation of environmental education.

There is a danger that pupils may become overwhelmed by the enormity of the problems that face the world that they become despondent.

Funding constraints, for transportation, materials and facilities is another problem that faces integration.

8. What did the literature reveal?

The literature revealed that environmental education is a difficult concept to define, and that it has different meanings for different people. It was necessary to clarify the concepts and to decide on a definition that can inform this research.

Teachers all over the world use a variety of teaching methods when teaching environmental education. It includes methods such as, problem solving, experimentation, field studies, simulation, by infusing ecological concepts and read and discuss.

It was also evident from the literature that the integration of environmental education into an inflexible curriculum presents problems.

This information will present me with a basis against which the data, that was captured, can be compared and interpreted.

CHAPTER 3

RESEARCH METHODOLOGY: PREPARING A DATA COLLECTION PLAN

1. Introduction

The purpose of this chapter is to give an account of the procedure followed to collect data to answer the research question: *the ways in which teachers integrate environmental education into the curriculum.*

The chapter will describe (1) the theoretical framework against which the data will be analysed, (2) the purpose of the research instruments, (3) how they were administered, (4) why a particular instrument was used and (5) problems that were encountered during the period of data collection.

It was necessary to obtain the permission of the Director Support Services of the North Durban Region, in KwaZulu-Natal to conduct the research.

2. Theoretical framework

The theoretical framework, which presents a framework within which the research is carried out, has a profound effect on the types of instruments that are chosen to collect data and ultimately how the data is analysed.

Research in environmental education can take place within three paradigms. (1) positivist, (2) interpretive and (3) critical. (Goodall 1994).

Most research in the topic area so far has taken place in the positivist paradigm. Research carried out in this paradigm is based on empirical pillars. The scientific method is followed and research instruments are designed to capture quantitative data. Positivists see this method of research as the only way in which research can be carried out objectively and the knowledge claims made are that it is rational and true.

The theoretical framework within which this research lies is the interpretive paradigm. The research question to be answered:

How teacher integrate environmental education into the curriculum?

Environmental education is a social construct. This research will be looking at the strategies teachers used to integrate environmental education into the curriculum. These strategies will depend largely on the understanding that the teachers have of the environment. To determine what their understanding is, I need to look within the teachers. It is not possible to do it from a distance.

The methodology in essence is interactive, field based and inductive. The instruments used to collect data include, a questionnaire, observation schedule, semi-structured interview schedule, a researcher's diary and teachers' diaries. Four teachers were observed and interviewed to present me with data. Both quantitative and qualitative data was collected. The role of the questionnaire was to capture data that would enable me to identify a sample of teachers whom could be observed whilst teaching, and then interviewed. Logical inferences are drawn from the data.

It is acknowledged that the research has a subjective nature to it. It is therefore that certain precautions are taken to ensure the validity of the research. To increase the validity of this study, triangulation was used. A variety of research instruments were used such as a questionnaire, observation schedule and interview schedule, all set to compare data and verify the responses given by the candidates.

The questionnaire was piloted to ensure that the questions were not ambiguous and that it captured what it set out to do.

A final precaution that was taken was to return the transcripts of the interviews to the teachers so that they could read and verify the information.

The nature of this research lends itself to an interpretive paradigm and the implications of this is realised and precautions taken to ensure the study is valid. It is against this paradigm that the data is presented and analysed.

3. A Survey

I conducted a survey of the teachers from 60 primary schools, who attended a workshop on using environmental education materials developed by the EECF (Environmental Education Curriculum Forum). The principal of the Durban Environmental Education Centre supplied me with a database of the schools and the relevant teachers.

A questionnaire (Appendix A) was sent to the teachers from the participating schools. A covering letter accompanied the questionnaire to explain the purpose of the research and to explain by when the questionnaire should be returned and how.

The questionnaire was piloted by sending it to a couple of colleagues and some teachers. Additions and alterations were made to the questionnaire to ensure clarity.

The purpose of the questionnaire was to (1) draw up a school profile, (2) a teacher profile, (3) identify topics and strategies used by teachers when integrating environmental education, (4) determine which topics or strategies were not used and (5) to draw up a resource profile of the school.

This information was used to select a sample of teachers that came from a moderately and well resourced school so that class observations could begin.

Of the 60 questionnaires sent to schools, 13 were returned and the information captured in SPSS, which is a statistical software programme. Frequencies of the data were determined.

Problems encountered during this procedure was (1) a delay in getting the database of the teachers from the principal of the Environmental education centre, as there was a problem with the software programme used to enter the data and (2) the returns of the questionnaires were very disappointing. This can be ascribed to the apathy of the teachers during a period in which schools have been in crisis. Many teachers were being redeployed and this caused stress, uncertainty and anger amongst teachers. In certain instances the teacher was no longer at that school.

4. Observations

One of the purposes of the questionnaire was to identify two schools from different resources context. To simplify this process, I tried to get two teachers from each of the two school types. One was a junior primary school teacher and the other a senior primary teacher. The reason for this was that teaching in the junior primary was integrated and thematic and the teaching in senior primary was according to the disciplines. Strategies employed in integrating environmental education into the curriculum may therefore be different.

To gain access to the schools proved difficult and caused a major delay in the research process. At first, contact was made with the principal and permission sought to approach the teachers. This simple exercise proved difficult as principals were constantly either in meetings or at workshops to ensure that the redeployment of teachers took place smoothly.

Once initial contact was made with a school, the principal had to approach the head of Department responsible for a phase, which then approached and informed teachers of the research.

This process took up to two weeks. Once all role players within the school were notified, and two teachers from two schools agreed to take part in the research, was a data collection programme faxed to the schools. This programme specified to teachers that classes would be observed and an interview held with them.

An initial meeting was set up with each of the four teachers. This took another week or two. I had to meet with four teachers at a time that was convenient for them.

Problems associated with this part of the research included (1) some teachers who did not want to take part in the research. Some teachers did not feel confident as they were not teaching in their present position or subject very long and did not feel comfortable with the prospect of an observer in the classroom and (2) in many instances teachers needed to think about the request to take part in the research. It proved difficult to get hold of them again. There were definite tactics of being avoided. When at last contact was made, the offer was declined and the search for another candidate begun.

In the end I was fortunate in getting two willing teachers from two schools. One was a junior

primary and one a senior primary teacher. For the purposes of this research they will be referred to as teacher 1 from school A, teacher 2 from school A and teacher 1 from school B, teacher 2 from school B.

Even though the principals and Head of Departments of these schools were very forthcoming, there were subtle indications from some of the teachers that they did not feel very comfortable, but felt obliged to take part.

Observations could now begin. It was hoped to observe each of the teachers on several occasions. This proved impossible. School B, were in the midst of birthday celebrations. With rehearsals and various school programmes, in preparation of the celebrations, it was difficult for the teachers, and me to set dates for observations. In the end each of the two teachers were observed once. The teachers at school B were observed on two occasions.

Inclusion of environmental education depended on the topic being taught. This meant that the lessons I observed would not necessarily present me with any insights as to how environmental education is integrated into the curriculum.

I requested that each teacher complete a diary for a week as environmental education may or may not occur in that particular lesson that I observe. Each teacher was given a research diary in which they could reflect on their lessons on a daily basis for a week. A format was given which specified what needed to be included in the diary (Appendix D).

The lessons observed were taped on audiocassette and transcriptions made of certain sections of the lesson. These were used to elaborate on or support observations made.

An observation schedule (Appendix C) was used during the periods of observation. This and narratives contained in the case studies, were used for data analysis.

An observation schedule was completed for each of the observations. This information was used to verify information on the questionnaire. Both the questionnaire and observation schedules were used in writing up a case study of each teacher.

Observations focussed on finding information that would verify the information in the questionnaire and to gain insights into (1) how class size may affect the integration of environmental education, (2) identifying teaching practices (methods and strategies) the teacher engaged in, (3) identify activities pupils engaged in and (4) the use of resources and other materials.

Problems associated with this part of the data collection plan was (1) only one of the teachers kept a diary for two days, (2) another wrote down pointers of the kinds of environmental topics they include in their Environmental studies syllabus, (3) the third teacher said that she could not write anything, as she had done nothing that was applicable to environmental education and (4) the fourth teacher still had to complete her diary. It was never received.

5. Post observation interview

As far as possible interviews were held just after the lesson observed. As the lessons observed were in the morning it worked out well in most instances as the lesson was followed by the morning break. In the instance where there were two observations for a teacher, the interview was held after the second observation.

The purpose of the post observation interview was foremost to (1) find out if they were indeed integrating environmental education into the curriculum, (2) find out why teachers selected and used certain materials, (3) to give them an opportunity to explain why they chose a particular environmental topic to integrate into the lesson, (4) identify strategies used, (5) to give them an opportunity to explain why they integrated the way they did and (6) to find out if resources played a role in the choices they had made.

The interviews were taped and transcribed. As there were only four transcriptions to analyse this was done without the aide of a software programme such as Ethnograph. The pointers used to describe the purpose of the interview, were used to consolidate the information. The information was used to complete the case studies.

The reason I used a semi-structured interview schedule (Appendix B), was that it would give me more freedom to probe and ask additional questions to get the required information. Deviations from the questions therefore did take place. In essence there was a core of

questions that were the same.

The problems experienced with interviewing began with teacher 2 from School B, who when looking at the interview schedule decided she needed more time to think about her responses and that the interview would take longer than she had anticipated. We arranged to meet the following day to conduct the interview. On my arrival at the school the following morning, the office staff called the teacher to the office. The teacher then gave me her short written responses to the questions on the interview schedule and an elaboration of topics that they do was written into her diary. There was not going to be any face-to face interview.

6. Summary table of data collected

In addition to the 13 questionnaires (including the 4 teachers observed), the following data was collected from the 4 teachers observed.

RESEARCH INSTRUMENT	TEACHER 1 *SCHOOL A JUNIOR PRIMARY	TEACHER 2 *SCHOOL A SENIOR PRIMARY	TEACHER 1 **SCHOOL B JUNIOR PRIMARY	TEACHER 2 **SCHOOL B SENIOR PRIMARY
Questionnaire	1	1	1	1
School profile	1	1	1	1
Teacher profile	1	1	1	1
Observation schedules	2	2	1	1
Post Observation Interview and transcriptions	1	1	1	Written responses to questions
Transcriptions of Teacher diary	-----	1	-----	1
Tape recordings of class proceedings	2 sessions	2 sessions	1 session	1 session

*SCHOOL A – public school

**SCHOOL B – private school

3.6 Summary

This chapter set out to give a cryptic view of events and procedures used to capture data. The complexity of the process was highlighted and related problems discussed. The reasons for using instruments were given and reference made to the kind of analysis that was done

This information will be presented in the next chapter as case studies.

CHAPTER 4

PRESENTING THE DATA

1. Introduction

The previous three chapters have sketched the background against which the evidence can be assessed. The purpose of this chapter is to present the data in such a way that inferences can be drawn.

This chapter will start off with a school profile of School A, which will be followed by a teacher's profile of Teacher 1. Then a detailed presentation of the data obtained by the questionnaire, observation schedules and transcripts of interviews is presented. This will be concluded by a summary. This will complete the case study for the first teacher. In similar way a case study will be presented of Teacher 2.

Before commencing with Teacher 1 and 2 from School B, a school profile will be given.

2. School profile – School A

2.1 Historical context

School A is a Primary school in the North Durban District of the Province of KwaZulu-Natal, South Africa. The school was a previous, House of Representative school, which catered for coloured learners in the area. Since the first democratic elections in 1994, the school was opened to all race groups. Since the school borders on the KwaMashu Township, many learners from the township attend the school. The staff is predominantly coloured.

2.2 Type of school

School A is a primary school and caters for learners from grade 1 to grade 7. On average the classes are 44 pupils in size. The medium of instruction is English, although for the majority of learners this is their second language.

2.3 Facilities at the school

The facilities mention here are within the school and not in the classroom. Teachers however do have access to them.

The external appearance of the school is satisfactory. It is in a satisfactory condition. It would appear as if a few classrooms need minor repairs to them. There is a school ground, but it is difficult to maintain. It is evident from what the teachers say is that they have an increased litter problem and they described the general state of the school grounds as being very poor.

The school has electricity and piped water. The school has such facilities as a telephone and fax machine, which are both in working condition. The school office does have a computer, a typewriter and photocopier to which the teachers have access. Other resources such as the school library and storeroom are described as very poor. The school also has a film projector.

The following are resources within the school that the teacher can use in the classroom:

Textbooks are available but are in poor condition. Not every pupil has a book. Teachers rely on notes and worksheets. All pupils have exercise books. Although the teachers do have access to audiotapes and an audiotape player, these are of a poor quality. There seems to be sufficient chalkboards and chalk. One of the teachers mentions that there is a television and video player. There are no overhead projectors. Wall charts are used. These are mainly acquired by the teacher or made by pupils.

The school does not have an environmental education policy.

Other facilities such as teacher cupboards, pupil desks and chairs are insufficient and in poor condition.

3. Case Study 1

Teacher 1 from School A

3.1 Teacher profile

Gender	:	Female
Qualifications	:	Teaching Diploma obtained at a College of Education. Major subjects are Needle Work and Biology. This qualification was obtained in 1993.
Teaching experience	:	5 years
Position at school	:	Teacher

3.2 Integration of environmental education into the syllabus

In response to the questions in the questionnaire (Appendix F):

- The teacher sometimes integrates environmental education into the curriculum.
- She rates her confidence to integrate as being high.
- She rates her competence to integrate as being high.

She attended a departmental workshop, which she found useful, but requires more training in environmental education and on how to integrate it into the curriculum.

When integrating the following strategies are used:

- Always makes use of recycling programmes and magazines when teaching environmental education.
- Often uses newspapers, role-play and poster making.
- Water audits, waste management, arbour day, projects and pupil investigations are used sometimes.
- She seldom uses ecology studies and field trips.
- Water quality tests, inviting guest speakers and lecturing to pupils are never used.

Who should be teaching environmental education?

In response to this question, the teacher felt that it should be taught:

- By teachers who are interested.
- Not only to inform pupils, but should lead to action.
- Across the curriculum.
- As a separate subject.

3.3 Teaching strategies

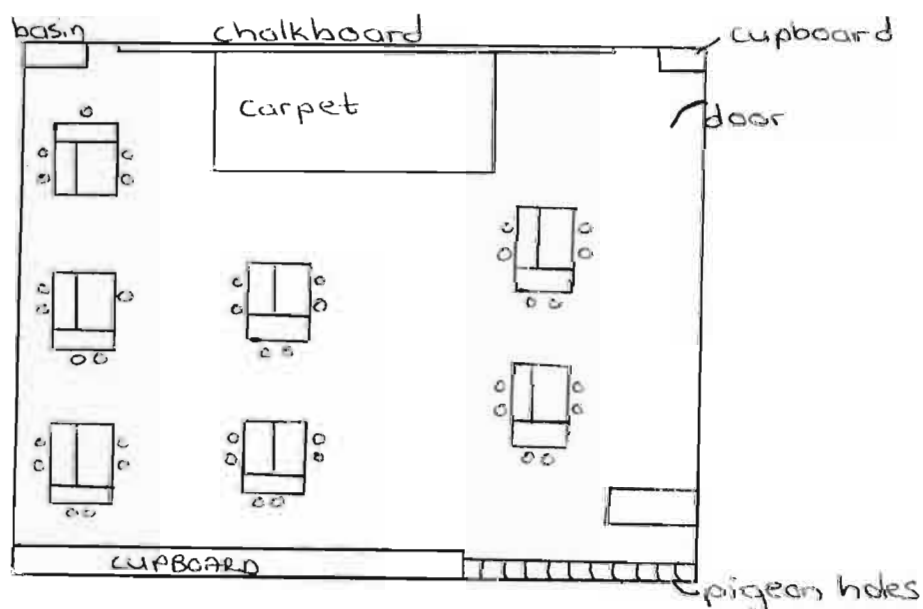
The pupils are arranged in groups, learning is activity based most of the time and learners get the opportunity to demonstrate what they have learnt most of the time.

3.4 Classroom Observations

First Observation

Grade	:	One
Number of learners	:	40
Site where lesson took place	:	Classroom
Duration of observation	:	8:20 – 10:00
Topic	:	Story of Joseph
Skills	:	Writing

Classroom plan (not to scale)



Grouping of pupils

Pupils sit in groups. The desks are arranged in this way. There is no evidence of group work. Each pupil does their own work and in some cases, there are pupils who do not want others to look and copy their work.

The reason for grouping pupils in this way is not evident, suggested reasons could be:

- To use the classroom space more effectively as there are 40 pupils in the class and the teacher needs a mat area where stories are told.
- The new curriculum demands that pupils not only sit in groups but also work together so that social skills and tolerance can be learnt.
- The teacher would like to foster a climate in which to develop social skills.

Questioning skills

The teacher asks simple recall questions that are mainly closed ended. This may be because more than half the class are second language learners who encountered English for the first time at the beginning of the year when they entered grade one. The teacher tries to keep it straightforward and simple.

The pupils on the other hand show their thinking only when the teacher encourages. It is difficult to focus pupils on what they need to do. This is attempted by teacher directed questions.

Feedback to pupils

Feedback about correct and incorrect responses is given in a manner that encourages further effort. This was particularly so for the written exercise.

Language of instruction

Communication is only in English. For the majority of pupils this is their second language. This is an English medium school and the teacher does not have the language skills to help second language learners in their vernacular. To overcome the problem she makes use of one of the pupils who have a better understanding of English to explain to the others in the vernacular. The teacher said that to get to this stage took patience and time. Pupils did not have the self-confidence to assist in this way previously.

Integration of environmental issues.

In this lesson observed there was no evidence of including environmental education. The lesson was aimed at developing writing skills. It was not done against the backdrop of any other context.

Classroom atmosphere.

The lesson was characterised by busy and noisy pupils. It was difficult to settle them down. It was evident that it caused the teacher a lot of strain and stress.

Summary

To summarise the lesson observed, the following points are noted:

- Learners do not work in groups.
- The lesson was not activity based.
- The teacher asked questions all the time to involve learners.
- The learners asked a few questions.

- The teacher did provide learners with individual feedback. To do this with 40 individuals was quite a task.
- Learners had the opportunity to practice their writing skills.
- The topic, although not related to the environment, was relevant to the learners' context.
- Pupils constantly interacted verbally with the teacher.

The lesson observed was a phonics lesson and resulted in subsequent writing.

The teacher had great difficulty in maintaining the attention of the learners and to get them to do what she wanted them to do. She describes the class herself as being quite difficult and that there are many that struggle. This is her reason for not engaging in other kinds of activities, but to stick to language and mathematical skills. "They can hardly cope with this, let alone any other kinds of aspects".

Group work is out of the question at present. Pupils find it difficult to relate to one another and to work together. She hopes that this can slowly be changed.

Not many environmental issues find their way into any particular lesson.

The teacher used at least one or two methods that involve learners. The lesson was interactive in that she asked questions to stimulate their interest and encourage them to participate.

To explain the teacher used no materials or other resource other than the chalkboard. The learners had to write down the letters and a few words. This was done in their exercise books. They could use any writing material. It was evident that some manipulated this resource by using different colours whilst others just watched. Many had to be encouraged to get on with the task at hand. By the end of the session not all had completed or attempted the task.

They had to copy the following into their books:

12 May 1999

W W W W W W W W W W

W W W

What Worm

What is your name

W W W

3.5 Second observation

Grade	:	One
No of learners	:	40
Site of lesson	:	classroom
Learning Area	:	Life skills
Topic	:	Seasons, Days of the week and the Weather.
Duration of lesson	:	10:35 to 12:00

Teaching methods

The teacher uses more than two methods. In this instance the teacher used questioning, class discussions and the story telling.

Teaching materials

The teacher made use of the chalkboard to draw and name the four weather conditions.

The learners did not manipulate any materials other than when they had to draw the four weather conditions into their books. Some pupils fought over the crayons. Very little sharing took place. Pupils did not want others to copy from their books.

Grouping of pupils

For half the lesson pupils sat on the carpet in the front of the classroom after which they had to go back to their desks to draw the weather conditions from the chalkboard.

Desks are grouped, but there is no evidence of group work. The teacher identified one learner per group to show the others where to work. This is a strategy the teacher employs to manage the class.

Critical and creative thinking

Learners are involved in sharing ideas. They all however try and do it at the same time. Pupils are trying to grasp basic concepts. Thinking is still very linear.

Questioning skills

The teacher asked a variety of questions that included open-ended questions that probed understanding. Evidence of this was the story on cloud formation. She ensures that they understand the concept by asking a volunteer within the class to repeat the story. Learners on the other hand tended to ask simple questions. The majority of the time they were engaged in reacting to questions posed by the teacher. They themselves posed few questions.

Feedback to pupils

Feedback about incorrect responses by pupils was given in a manner that encouraged further effort.

Language of instruction

Communication is in English. Although language is a problem, pupils seem to understand the instructions given. To ensure that this is so, the teacher has identified a pupil within each group that she instructs to show or explain to the rest in the group.

Integration of environmental issues

The topic chosen was appropriate for the level at which the learners function. The topic as a whole was environmental. How human action may impact on weather conditions over long term was not dealt with. It could be argued that this may be too advanced for pupils. It may be best to start off developing basic vocabulary.

The teacher made use of class discussions, story telling, followed by drawing to bring it into the lesson.

The teacher chose the programme Life Skills and the phase organiser Environment, and chose the context herself. The content of the new curriculum is flexible and not prescriptive. It gives the teacher the opportunity to select the context to meet the developmental level of the learners.

Classroom atmosphere

The lesson was interrupted several times to reprimand pupils for incorrect behaviour.

Summary

The teacher asked all the pupils to join her on the carpet. They sat in a semi-circle facing the teacher. She introduced the topic by going over the days of the week. This led on to a discussion of various weather conditions. They had to recall what the weather was like on particular days. It remained difficult to get all the pupils' attention. There were a few misbehaving and the lesson had to be stopped several times to reprimand them.

Pupils went on to describe the weather of that day. Linking certain weather conditions with various activities such as a hot sunny day with the beach and swimming.

The teacher leads them through questioning. All the pupils tend to answer at the same time or volunteer to share their stories. The reference the teacher made was that they sounded like a flea market. There are still pupils that are not involved and getting up to mischief.

The teacher went on to discuss the seasons. Still drawing the answers out of the pupils. "There are four seasons. Who knows what they are?" Weather conditions associated with each season were referred to.

The teacher chose a very broad topic that led on to a discussion of clouds and cloud formation. The latter was described as a story. An extract follows:

'T' refers to what the teacher says and 'P' to the pupils' responses.

T "What is inside the clouds?

P Water.

T How does the water get inside the clouds?

T Do you know?

P No.

T Right (reprimands two pupils). Now I'm going to tell you a story. Fold your arms and your legs. It's a nice story. (Reprimands pupils). Mbali, once upon a time there was a little water droplet. Do you know what a water droplet is? (Directed to all pupils).

P No.

T It is a tiny (emphasis given) drop of water. Now this little water droplet, his

name was Tot.

P Response not heard.

T No, his name was Tot. He was a tiny little bit of water. One day Mr Sun came out and Mr Sun was shining nice and bright. And do you know what Sun did to Tot, the water droplet? (Reprimands pupils).

P No.

T Now the sun (reprimands pupils), the sun has lots of rays, lots and lots of arms when it shines. And all these arms around the sun produce heat and make whatever the sun touches, hot. So when Tot was a droplet, which was floating on the river, one of these arms of the sun came and swallowed him up. Tot the water droplet disappeared. He evaporated. Sandile, what happened to the little water droplet? When the sun's arm came and swallowed him up? What happened to him? Disappeared. Say that.

P Disappeared. (All pupils repeated after the teacher).

T He evaporated. That means (not heard) when Mr Sun came and swallowed him up, the water droplet disappeared. But we never see him going up in the sky. And when he got to the sky, Tot and all his brothers and sisters that were swallowed up by the sun, they formed big, big clouds. Big heavy rain clouds."

Once this discussion on the carpet was finished they were asked to go back to their seats and to draw the four weather conditions that the teacher was drawing on the board.

4. Case study 2

Teacher 2 from School A

4.1 Teacher profile

Gender	:	Female
Qualifications	:	Three year teaching diploma. Major subjects are Art and History. This qualification was obtained in 1990.
Teaching experience	:	8 years
Position at school	:	Teacher

This school decided on class teaching in the senior primary school. This means that the teacher is responsible for teaching all the subjects to her class in all the subjects. Previously only certain subjects were taught by the class teacher. This new approach to delivering the curriculum presents the teacher with an ideal opportunity to incorporate environmental education across the curriculum.

4.2 Integrating environmental education into the curriculum

In response to the questions in the questionnaire (Appendix G):

- The teacher often integrates environmental education into the curriculum
- She never finds it difficult to integrate.
- She sometimes integrates it into her Science lessons
- She rates her confidence in integrating environmental education into the curriculum as being high.
- She rates her competence in integrating it into the curriculum as high.
- She had not attended a Department of Education workshop on environmental education, and feels that she needs training in environmental education.

When integrating the following strategies are used:

- She always makes use of waste management and arbour day.
- She often makes use of recycling programmes, field trips, poster making, guest speakers, lecturing and the showing of videos.
- She sometimes does the water audit, projects, uses magazines and newspapers and carries out pupil investigations.
- She seldom does the water quality test or uses role-play.
- She never does any ecology studies.

Who should teach environmental education?

In response to this question, the teacher felt that it should be taught:

- Not only by the Science teacher.
- Not only by teachers who are interested.
- Not only to inform pupils, but lead to action.
- Across the curriculum and not as a separate subject.

She also agreed that teaching about the environment was not a waste of time, that it was a cultural subject and that it should not just create awareness.

4.3 Teaching strategies

Pupils sit in rows. The teacher sometimes engages in activity based learning. Pupils are often afforded the opportunity to demonstrate what they have learnt.

4.4 Support

In response to the question of what support she gets from colleagues her answer was that she got no support from other educators in her school and could sometimes bargain on the support of the principal and other management staff.

4.5 Classroom observations

First Observation

Grade	:	Five
Number of learners	:	43
Site where lesson took place	:	Class room
Duration of observation	:	8:20 – 10:00
Subject	:	Mathematics and Science
Topic	:	Mathematics : long division Science : water

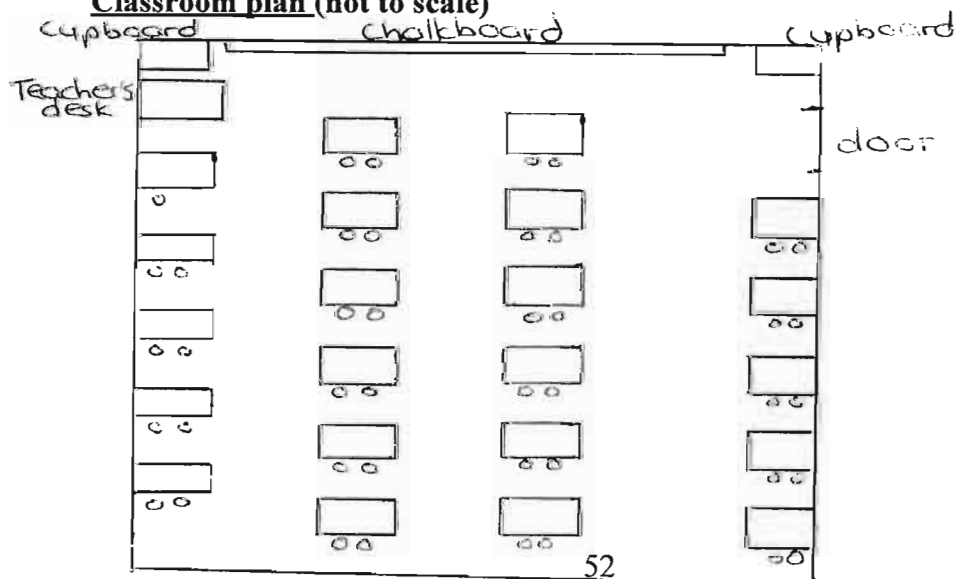
Introduction

The lesson began with the marking of Maths homework. This included four exercises on long division. Pupils had to mark each other's homework.

The pupils' test on word sums was handed out and discussed. This was followed by feedback on the Science test on water. Various questions were posed and discussed. The work sheet on water was next discussed. This lead on to various discussions. One of rural women who walk to streams to get their water. They carry this water on their heads. "Rural people carefully use this water, where we here in the city only have to open a tap."

This was a consolidating lesson in which the teacher was finishing off the topic before going on to the next topic.

Classroom plan (not to scale)



Teaching methods

he teacher uses 1 or 2 methods that involve learners. The methods used were, chalk-and-talk and class discussions.

Materials

The teacher made use of work sheets and the chalkboard. Learners did not manipulate material as such. They followed the teacher on their work sheet.

Grouping of learners

There are no groups. Desks are arranged in rows. There is hardly any space between rows. It would be impossible to arrange the classroom in any other way, as there are 43 desks and a teacher's desk to manipulate.

Critical and creative thinking

Learners are involved in discussions and problem solving. The teacher used an example of the local swimming pool. Another problem posed as what would happen if they turned off the school's water supply for a day? The teacher tended to pre-empt the problems, rather than give the pupils a chance to anticipate some of the problems.

Questioning

The teacher asks a variety of questions, including open-ended questions that probe understanding.

Pupils ask questions that show their thinking only when the teacher encourages.

Feedback to pupils

The teacher gives pupils feedback about correct and incorrect responses in a manner that encourages further effort.

Language of instruction

This is an English medium school and the language of instruction is English. There are however many second language learners in the class. This does not seem to be a problem.

Integration of environmental education

Water is one of the Science topics prescribed in the syllabus. The teacher brought in health aspects related to water, conservation of water and the uses of water.

The environmental aspect was included into this lesson through discussions.

Class atmosphere

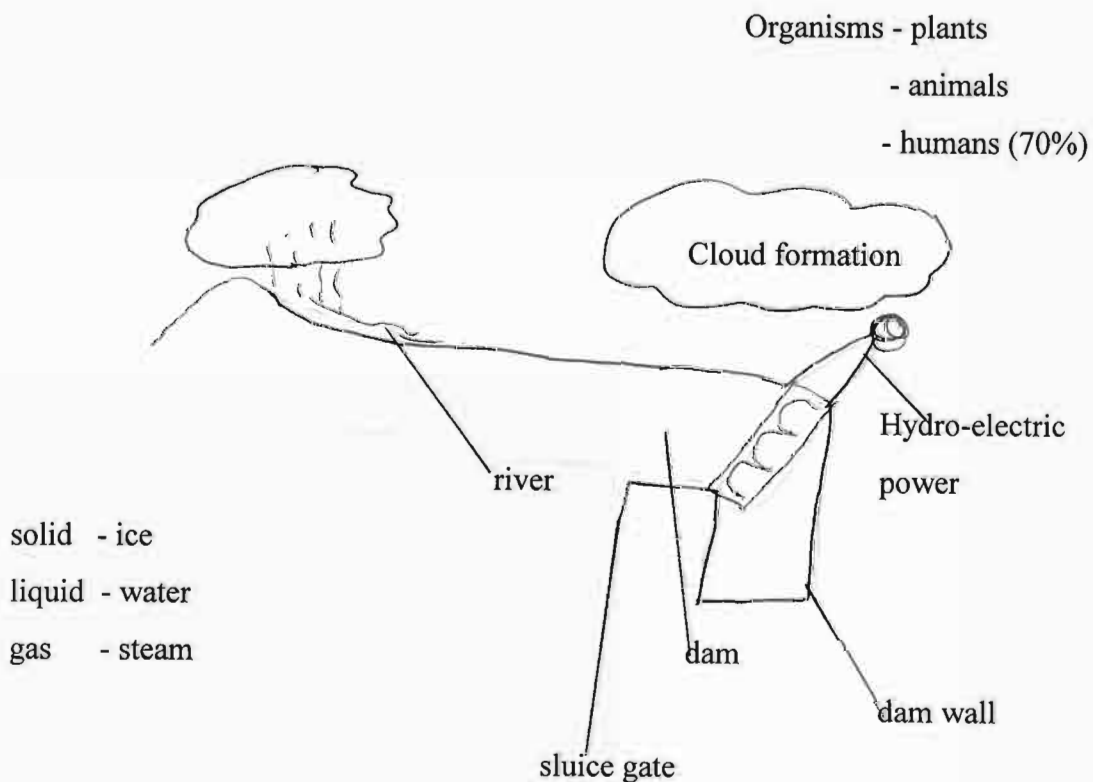
The atmosphere that prevailed in the classroom was relaxed. Pupils were interested in the topic and actively took part in the discussions.

Resources

During this lesson the teacher made use of the chalkboard to explain concepts such as:

- Water cycle.
- Dams, sluices and hydro-electrical energy.
- Phases of water.
- Who needs water?

Chalkboard summary



Summary

No new ground was covered in this lesson. It was a lesson to consolidate what was done previously.

During this lesson:

- Pupils did not work in groups
- Learning was not activity based
- Environmental issues were included
- The teacher posed questions throughout the lesson.
- In some instances learners asked questions.
- The teacher sometimes provided learners with feedback.
- Pupils were given the opportunity to demonstrate what they knew by responding to some of the questions posed by the teacher.
- The topic is prescribed by the syllabus, and was dealt with at a level that was relevant to the developmental level of the pupils.
- The chalkboard was used effectively as a resource.
- The pupils interacted several times with the teacher.
- Learners did not engage in hands-on activities in this lesson.

4.6 Second Observation

Grade	:	Five
Number of pupils	:	43
Site	:	Classroom
Duration of observation	:	10:20 to 12:00
Subject	:	Geography
Topic	:	Our Country and Globalisation

Introduction

It was evident that the teacher is confident in teaching about the environment. Her lesson evolved around the globe and the parts that constitute it. She skilfully uses role-play and everyday examples to bring across the message that the world is not that big and that no matter where you might find yourself on the globe, your actions affect others around the globe. The extract of the lesson, later on in the chapter, from the lesson illustrates this. It makes it lively and interesting for the learners, rather than hearing only a lot of facts. It is made relevant in that the teacher uses examples that they can relate to.

Repetition of facts during the lesson in different ways is another strategy she uses to reinforce the message that she wants to bring across.

Teaching methods

The teacher made use of two teaching methods that involve learners. The lesson was interactive with the teacher posing many questions and the class engaging in class discussions. The teacher illustrated with examples that learners could understand and relate to. The idea of the Global Village was clearly illustrated by such examples. Instruction is mostly transmissive.

She enhanced the lesson by telling stories and anecdotes.

To reinforce important points or facts she would repeat it at least three times on different occasions throughout the lesson.

Materials

The teacher made use of the chalkboard and when required, she used a globe, to illustrate. The pupils engaged in worksheets and notes. The notes contained a world map to which the teacher referred.

Grouping of pupils

As explained in the first observation, desks have been placed in rows. The physical size of the classroom does not allow for the manipulation of 43 desks and a teacher's desk. There is limited space between desks that also limits the teacher's movements

within the class. She is restricted to the front of the class. Desks are arranged in pairs that could allow for discussions between pairs. There is however no evidence of allotted pairs and working in groups or pairs. The lesson takes on mostly the format of the teacher talking, posing questions which results in some class discussion.

Critical and creative thinking

Pupils are involved in discussions. They are encouraged to think and participate. The teacher discussed the fact that the earth was made up of various continents and that they could all be pieced together to form a whole. She now asks the pupils why God did this. This resulted in various responses from pupils such as: "So that we could have many countries." The teacher volunteered and reinforced what the pupil had said by saying that this meant different cultures and different people. To encourage them to think this through she would make use of role play and asked if he was God why he would break up the land in continents.

Questioning

The teacher does ask a variety of questions that probe understanding and make pupils think about their actions. What they do, affects others. They needed to consider the consequences of their actions.

Pupils engage in questioning which show creative thinking even without teacher encouragement. Pupils were very involved and eager to ask questions and share their experiences. One pupil asked how they knew that the earth was round.

Feedback

Feedback is given to pupils in such a way to encourage further efforts.

Language

As previously explained, this is an English medium school and the medium of instruction is English although more than half the class are second language learners.

Integrating environmental education into the curriculum

The teacher links a syllabus topic to an environmental topic or issue. In this instance she touched on globalisation and stressed that what we do affects the world in which we live.

The teacher integrated the topic into the lesson through discussion. The lesson took on the format of a lecture. Although the notes did include a group activity it was done as a class group. This may be because of the availability of only one globe.

Classroom atmosphere

The atmosphere that prevailed throughout the lesson could be described as busy. It was evident that learners were interested in the topic and eager to answer questions posed and take part in the subsequent discussions.

Resources

The chalkboard was used to show the relation between the sun and the earth, to show the continents and to write up unfamiliar words.

The globe was used to show the continents, oceans, equator, Northern and Southern hemispheres.

Extract from lesson

In this extract 'T' will refer to the responses of the teacher, whilst 'P' will relate to the questions and answers of pupils.

T Do you know why I think He did it? Because sometimes we forget that we are on one little planet. Even though we are on large [response not heard] of land and these continents are separated from each other by the oceans. We forget sometimes that we are after all – we all live on this planet. So it means that what happens in Africa, is going to affect what happens in South America and that is going to affect what happens in North America and that's going to affect what happens in Eurasia and that is going to affect what happens in Australia.

See this class. This entire class is the world, is the sphere, right. [Pointing to individual pupils] This is Africa, this is Australia, this is North and South America

and this is Eurasia.

So if I come into the class and there are papers on the floor, there is noise, books are all lying on the floor and I am only going to punish Africa. No I'm going to punish Eurasia and I'm going to punish North and South America and I'm going to punish Australia. And that is how it is on earth. We forget that we are all on the earth and so if something happens in one continent, in one country, in one city, in one town it affects the entire earth, right. And it affects the whole globe.

What kinds of things can happen that can affect the entire globe? Besides war. We all know about war. What natural things can happen that can affect the entire globe?

L Disease.

T Yes that's right. If disease is not checked in time. Stopped in time it can spread across the whole globe. Right what else?

L Litter.

Summary

It was evident that the teacher made a point to include an environmental issue into the pupils' learning experience. This was mainly done by posing questions, discussions and answering the work sheet that they were working from. It was evident that pupils did not work actively in groups nor was the lesson activity based. It did however have the potential of being activity based given the necessary resources. The topic and the work sheet were relevant to the learners' context. The resources that were available were used effectively.

4.7 Teacher's diary

Subject	:	General Science
Topic	:	Practical on how to make a water filter
Number of pupils	:	43
Duration of lesson	:	45 minutes

The environmental education concept that I included was the importance and relevance of water recycling.

At the end of the lesson each pupils should have made a water filter and recycled water.

I asked the pupils why they think water filters were necessary.

I made use of worksheets and pictures so that the pupils could see what a water filter looked like and how they could construct one on their own.

Subject	:	Geography
Topic	:	Our Country
Number of learners	:	43
Duration of lesson	:	30 minutes

The environmental concept that I wanted to bring across to the pupils was that the entire world is affected by environmental disasters.

The lesson went well. The pupils grasped the concept of the environment being a global issue.

The methods used were questioning, story telling and discussion to include the concept into the lesson.

Resources used were a globe, maps and the chalkboard. They illustrated the interrelationship of the continents and oceans on the earth.

5. School profile – School B

5.1 Historical context

School A is a Combined school in the North District of the Province of KwaZulu-Natal, South Africa. It is a private school and is open to all race groups. The majority of pupils are however white. The school is situated in a previously white suburb of Durban. The staff is predominantly white.

5.2 Type of school

School A is a combined school and caters for learners from grade 1 to 12. On average the class are 24 pupils in size. The medium of instruction is English.

5.3 Facilities at the school

Facilities within the school, to which the teacher has access, but not necessary used in the classroom as such, will be referred to as well as facilities that teachers can use in their classroom.

The external appearance of the school is good. There is no evidence of maintenance that needs to be done. The painting is good and the gardens are regularly maintained and manicured. The furniture in the classrooms, although not new, is neat and well maintained.

The school has electricity and piped water. The school has excellent communication facilities such as telephone, fax and Internet and email facilities. School grounds are sufficient and well maintained.

Teachers have access to photocopying facilities, computers and typewriters. They do have a storeroom, which is in a very good condition. There is a film projector, audiotape player, audiotapes and a television and video player in a specialised room, the audio-visual room.

The resources that the teacher uses in the class room, includes text books, exercise books, an overhead projector, chalkboard, chalk and wall charts – all of which are described as being in very good condition. Resources such as scissors, paper, crayons and glue are available. The teachers do have a teacher's cupboard and there are sufficient chairs and desks for all pupils.

6. Case study 3

Teacher 1 from School B

6.1 Teacher profile

Gender	:	Female
Qualifications	:	Teaching diploma. Major subjects are Remedial Education and Biblical Studies. This qualification was obtained in 1972.
Teaching experience	:	26 years
Position at school	:	Teacher

6.2 Integrating environmental education into the curriculum

In response to the questions in the questionnaire (Appendix H):

When integrating the following strategies are used:

- She always makes use of Arbour day, recycling programmes, magazines and newspapers when including environmental issues.
- She often makes use of the water audit, water quality test, waste management, ecology studies, projects, pupil investigations, role play, poster making and guest speakers.
- Field trips and the showing of videos are sometimes used.
- She never uses lecturing.

Who should teach environmental education?

- Science teachers should not only teach it.
- She is unsure whether teachers who are interested should teach it.
- She agrees that it should not only inform pupils, but lead to the taking of action.
- She agrees that it should be taught across the curriculum and not as a separate subject.
- She has not indicated whether she sees it as a cultural subject.
- She strongly disagrees that it is a waste of time.
- She disagrees that it should only create awareness.

6.3 Teaching strategies

Learners are placed in groups. Learning is always activity based, and learners always provided with the opportunity to demonstrate what they have learnt.

6.4 Support

Support in integrating environmental education into the curriculum is always forthcoming from other colleagues, the principal and management.

6.5 Classroom observation

Grade	:	One
Number of learners	:	24
Site	:	Classroom
Duration of observation	:	10:50 to 11:30

Learning Area	:	Life Skills
Topic	:	Voting

Introduction

This lesson was the culmination of other lessons about the elections where they now actually vote. Earlier in the week they chose four leaders to represent the four parties. The parties are the Turquoise Party, Butterfly Party, Violet Party and the Golden Party. Another lesson was spent on making their ID books.

The procedure of voting was explained and a few pupils identified to represent the IEC (Independent Electoral Commission). Each of these pupils had to work at one of the following stations:

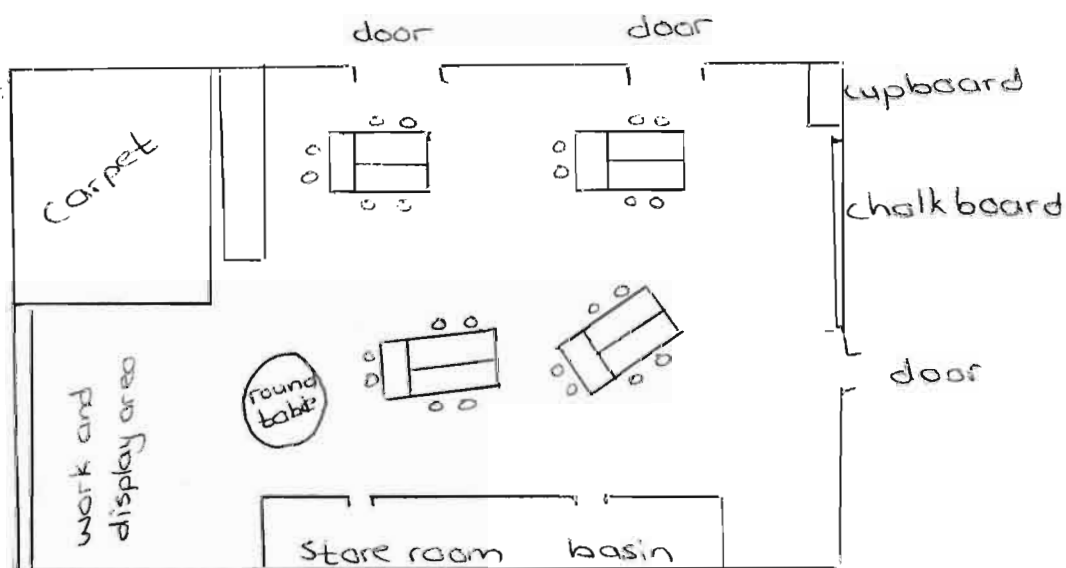
- Door Controller – who checks the photo in the ID book against the face of the person.
- Scanner - Who will scan the ID books.
- The person to tick off the name holder of the ID book against the voters' role.
- The person who puts ink on the thumb to show that they had voted.
- Person who hands out the voting forms.

- The person at the voting box who ensures that people fold their voting form before entering it into the box.

The class thoroughly enjoyed this hands-on experience.

To ensure that those who were waiting to vote and those who had already voted became restless, they had an additional task to perform at their desks.

Classroom plan (not to scale)



Teaching methods

The teacher made use of two or more methods, all of which involved pupils. The lesson was interactive, with some discussion and an activity. A real life scenario was acted out which made a great impact on pupils.

Materials

The teacher makes use of a variety of materials such as the making of identity documents, a ballot box, telephone which is used as a scanner, a list of names of the potential voters and ink to show that a person had already voted.

The pupils share and manipulate the materials. Some of the pupils had to work at each of the stations in the voting room whilst the rest of the class voted, after which the roles were reversed to allow those who worked the stations to cast their vote.

Grouping of pupils

The teacher uses permanent groups without assigned roles. Roles may be decided as the need arises. At this stage pupils tend to still work individually and not as part of a cohesive group.

Critical and creative thinking

During this observation pupils were involved in a teacher-directed activity, which did not necessarily create the opportunity for problem solving and creative thinking. To ensure that pupils understood reasons for certain procedures, the teacher asked questions.

An example was when she told them that the ink had to be placed on the left thumb she asked them why the left thumb. One pupil responded by saying that it will show that you had voted. The teacher probed further by asking: "What else?" To which another pupil responded: "Because if you vote a lot of times and they didn't put the ink on, so they know that you have voted, so that you don't vote and vote and vote. So that team wins."

Questioning

Questions asked were simple and closed-ended. These were basically to ensure that all knew the procedure of voting. One pupil asked if they were supposed to make a tick or a cross. The teacher asked the pupils which part of the ID book needed to be scanned. They all gave the correct response. She went on to explain that one is not allowed to copy documents such as ID books and passports as this was fraudulent.

Feedback

Whilst the pupils were voting the teacher kept vigilance and assisted students on their way from station to station. Most of the pupils however understood the procedure as it was explained to them on more than one occasion. Feedback about correct and incorrect responses was given in such a manner as to encourage further effort.

Language

This is an English medium school and the medium of instruction is English. Most of the pupils but two, have English as their first language.

Integration of environmental education into the curriculum

The outcomes based curriculum that this teacher is currently engaged in, allows her a lot of flexibility. She is looking at the environment in its broadest sense by incorporating the political environment. She has achieved this by using voting as her topic. This is a current issue, which interests pupils at present, since the country has just recently had an election. She made use of a class activity to demonstrate the process. Other ethical issues such as the secrecy of a person's vote and political tolerance was discussed.

Classroom atmosphere

It was evident that the pupils enjoyed the lesson. Using their own made identity documents and engaging in the process rather than just hearing of it, has made it unforgettable and interesting for them.

Summary

Pupils thoroughly enjoyed this lesson. The whole lesson was activity based and the teacher opted to integrate an environmental issue with a difference into her Life Skills programme. The teacher's questions were directed at ensuring that all pupils understood the voting procedure and why each of these procedures was important. Pupils' questions were directed at reaffirming what the teacher previously said.

Pupils had ample opportunity to either verbally or when going through each of the voting stations to demonstrate what they had learnt. The topic was made relevant to learners in that they had constructed their own voting system based on how it happened in real life. Materials and resources applicable to their context were used. The teacher made use of the pupils' imaginations! They used an old broken telephone as scanner which says nothing about what a scanner does and what it looks like, but it is about improvising and using what is available to get the message across.

7. Case study 4

Teacher 2 of School B

7.1 Teacher profile

Gender	:	Female
Qualifications	:	Public relations at a Technikon in 1984 and a Teaching Diploma at a College of Education in 1988. Major subjects were Computers and Mathematics.
Teaching experience	:	10 years
Position at school	:	Teacher

7.2 Integrating environmental education into the curriculum

In response to the questions in the questionnaire (Appendix I):

- The teacher often integrates environmental education into the curriculum
- She rates her confidence in integrating environmental education into the syllabus as very high.
- She also rates her competence in integrating it into the syllabus as very high.
- She did not attend the Education Department's workshop on environmental education and does not require any training in environmental education.

When integrating the following strategies are used:

- She always makes use of the water audit, waste management, harbour day, recycling programmes, projects, magazines, field trips and pupil investigations.
- She often makes use of the water quality test, ecology studies, newspapers, role play, poster making and the showing of videos.
- Guest speakers and lecturing are sometimes used.

Who should teach environmental education

- Science teachers should not only teach it.
- It should be taught by teachers who are interested

- She agrees that it should be taught across the curriculum and not as a separate subject.
- She agrees that it should not only inform pupils but lead to action.
- She does not agree that it is a cultural subject.
- She disagrees that it should only create awareness of the environment.

7.3 Teaching strategies

Pupils are seated in rows and learning is mostly activity based. Pupils are provided with the opportunity to demonstrate what they have learnt.

7.4 Support

The teacher gets support from other educators at school as well as from the principal and management staff when integrating environmental education into the curriculum.

7.5 Classroom observation

Grade	:	Six
No of learners	:	24
Site	:	Classroom and Corridor
Duration of the lesson	:	10:45 to 11:30
Subject	:	Environmental Studies
Topic	:	Food and where we get it. How plants store food.

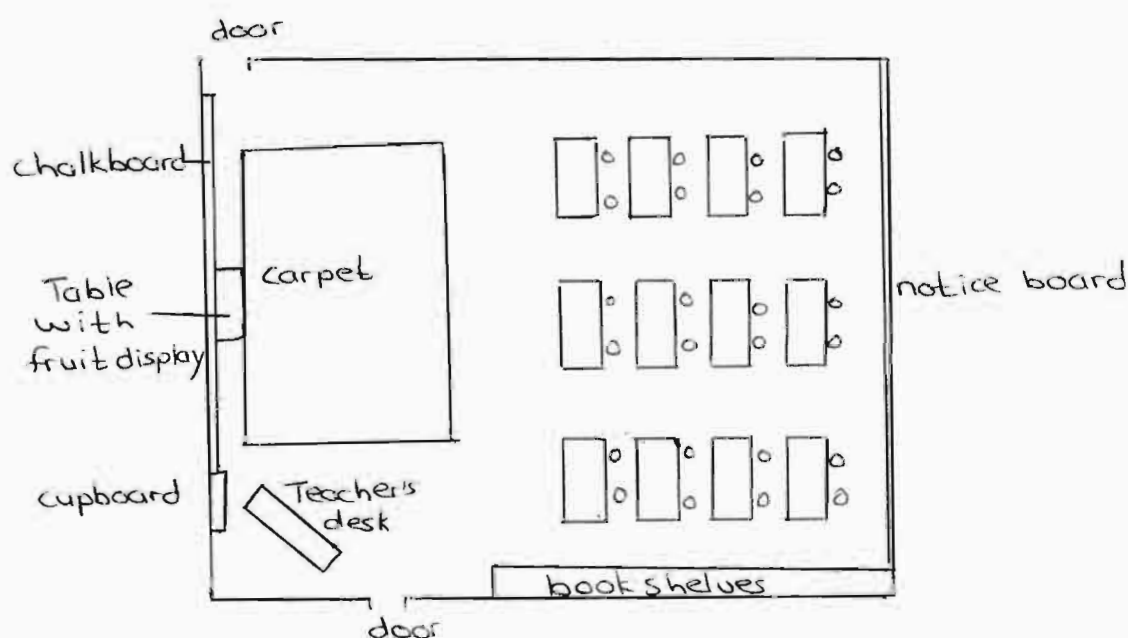
Introduction

This was an introductory lesson on plants as producers and will run over several weeks. Pupils will be exposed to various activities including surveys. They had been given a homework task in which they need to note down which parts of a plant[roots, stems, leaves or flowers or whether it was a fruit or vegetable] they were eating for supper over a seven-day period. This will lead to other sub-topics such as conditions for growing plants and the effect of pesticides on the environment.

The teacher informed me that the approach they were following with the grade 6 pupils this year was significantly different from previous years. They are engaging in whole class teaching and within the subject Environmental Studies various topics and themes

are identified and an activity based programme followed. Within such as theme, various subjects are catered for such as Language. In this particular lesson reference was made to collective nouns and the meaning of words were looked up in the dictionary. Through this activity-based programme pupils are exposed to various process skills such as graphing, observing, gathering information and processing information.

Classroom plan (not to scale)



Teaching methods

The teacher uses more than two methods that involve learners. The lesson was interactive and involved a class discussion and an activity.

The teacher had a fruit and vegetable display in the front of the class. Pupils had to look at the display and then in groups of four decide on what a fruit was and what a vegetable was.

The lesson evolved around the teacher cutting open the various fruit and vegetables on display so that they could see if it contained seeds. Her deductive approach kept them

spellbound as they had to, with guidance from her, look for evidence to decide on whether a particular example on the display was a fruit or a vegetable and whether it was a root, stem, leaf or a flower.

Materials

The teacher uses more than two kinds of materials. She had a display of various fruits and vegetables on a table in front of the class. Seedlings were transplanted to monitor their growth.

Pupils were not given the opportunity to touch the fruit and vegetable display. Some used dictionaries to look up the meaning of various words such as what a fruit was and what a vegetable was.

Grouping of pupils

The desks in the classroom are arranged in rows. When the task however demands it, groups are flexible and there are no assigned roles. During this session all learners sat in the front of the display on the carpet. They were asked to form groups of four and discuss the differences between fruit and vegetables. They had to come up with an explanation that would explain the differences between fruit and vegetables. Groups were formed informally.

Critical and creative thinking

In some instances responses of pupils demonstrated critical theory. They were presented with many problems and had to look for evidence to support their claims.

Questioning

The teacher asked a variety of questions including open-ended questions that probe understanding. This was done to establish if pupils understood the subtle differences that existed between fruit and vegetables.

Learners asked questions that showed creative thinking even without the teacher encouraging. One pupil asked if one could taste the seeds in a banana. Another wanted to know if one could feel the seeds of a banana

Feedback

Feedback was given to pupils in such a manner that it did not discourage them from further effort.

Language

The teacher uses the home language of the pupils that is English.

Integration of environmental studies into the curriculum

Integrates the environment as the producers as part of a syllabus topic. Language is also incorporated for example the meaning of pips and seeds.

The particular environmental issue that was included was the cultivation of plants as food. The strategies used to integrate it into the lesson included, discussions and a class exercise.

Classroom atmosphere

The atmosphere could be described as being interactive. Pupils were very involved and interested.

Resources

The display of fruit and vegetables included: cabbage, carrots, tomato, lemon, broccoli, grapes, sweet potato, apple, gem squash, cauliflower, madumbi, turnip and a banana.

Summary

- Pupils had the opportunity to verbally demonstrate what they had learnt.
- Learners were taken into the corridor to plant seedlings in growing pots.
- The topic and activities were relevant to the learners' context.
- Resources were used effectively at all times.
- The materials and equipment provided a range of experiences.
- Pupils engaged in some hands-on activities.

8. Summary

This chapter set out to present the data that was captured by the questionnaire of the four teachers, the observation schedules and interviews. Headings were identified under which the information was organised. The information under each of these headings will be compared in a cross case analysis in chapter 5.

CHAPTER 5

CROSS CASE ANALYSIS

1. Introduction

This chapter will focus on comparing the data obtained from the four teachers to identify any commonalities and differences. Although many aspects will be compared, the focus will be on the kinds of strategies teachers employ to integrate environmental education into the syllabus and why they use these strategies. It can however not be ignored that the context of the school and the pupils that it serves, will have an impact on classroom related activities and thus the extent to which environmental education is included into the curriculum. Therefore these aspects will also be looked into. It is also hoped that this chapter will consolidate the evidence, so that possible trends can emerge. Inferences will be drawn from these to inform chapter 6.

The analysis begins with a comparison of school profiles. The resources within the school and in the community that it serves will be looked into. Thereafter a profile of the pupil population will follow. The body of the discussion will centre around a comparison of classroom practice, topics covered, and curriculum delivery in general and how it is done specifically in environmental education.

2. The school context

A school profile (Appendix E) was drawn up from the data given in the questionnaires and observations made by the researcher.

The most significant difference between the schools is that School A is a Public school whereas School B is a private school. This has certain implications in the running of the school and subsequently the delivering of the curriculum. School A being a public school, employ teachers whom are paid by the State. They are allowed one teacher for every 44 pupils. The financial support that was forthcoming to the school when it was still under the House of Representatives, stopped when the department ceased to exist and the school became part of the KwaZulu-Natal Education Department in 1995. Since then the school has faced financial difficulties. Sources of income for the school are school fees, but this is not forthcoming. The majority of pupils do not pay school fees. The money that the school has

must be spent wisely to ensure the day to day running of the school. This includes the paying of water, electricity and telephone bills, for which schools are now responsible. Servicing of the copier and buying paper and stationery for the office are added expenditures. Very little of the money finds its way into the classroom if any.

On average there are 44 pupils per class. There is hardly any space for furniture for all the pupils. The teachers find it difficult to cope with such a large class. This is added stress and can make teaching unbearable.

School B on the other hand have the financial resources to employ a sufficient number of teachers to ensure that their classes average about 24 pupils. There is no doubt that it is easier to manage and deliver effective teaching to a group of 24 pupils than it is to a group of 44. Teachers will tend to set fewer assessments (formal and informal) as it becomes a problem to manage.

One of the teachers from school A mentions that finance is a major problem. She mentions that it is not just the finances in the school but that of the community they serve.

The schools are located in vast different areas. School A is situated a few kilometres North of Durban and is bordered by the Township of KwaMashu. Many of the pupils who attend this school come from the Township. This Township historically houses black South Africans, many of which are described by the one of the teachers at the school as being from a low socio-economic background. This in itself presents the school with problems, as there are many vandals, not necessarily pupils from the school, who vandalise the school that is already cash strapped.

School B on the other hand is located in an affluent area in one of the suburbs of the city of Durban. Pupils who attend the school generally come from homes of a higher socio-economic status.

This scenario in itself will determine the kinds of resources that teachers have access to in delivering their curriculum. This includes human and physical resources and those in the community that serves the school.

3. Teachers' profile

All four teachers are female and have had their training at a Teachers' Training College.

Although the teachers from School B together have many more years of teaching experience, those from School A cannot be classified as beginner teachers. All four teachers thus carry significant teaching experience.

They all rated their confidence and competence in integrating environmental education into the curriculum as being high.

Their effectivity to deliver the curriculum is influenced by (1) class size, (2) the lack of physical resources and (3) support from colleagues and management.

4. Pupil profile

As previously stated, the pupils attending School A mostly come from the KwaMashu area. One of the largest townships in the greater Durban area. Many of the pupils come from homes that are socio-economically deprived. Due to the hardship of many parents, they work long hours that result in pupils having chores to do at home after school and do not find time to do homework. Financially most of the parents are unable to assist the school. The sad thing is that in some instances parents view schools as day care centres which look after their children while they are out earning a living. These children and their parents are basically trying to make the best under difficult circumstances.

School B, situated in an affluent part of the city of Durban, draws pupils from a high socio-economic status.

The question that needs answering is how all of this affects teaching. It does have an impact one way or another. Finance is not always the only dilemma. Providing a child at home with a place to study and time to do homework and moral support when required is of great importance. In other instances the school may ask for inexpensive resources, but because the family is only making ends meet, these are not always forthcoming. Teacher 2 of school A mentions that the community they serve, is used to being on the receiving side, and when asked to send something to school, 5% or less of the class will bring the requested resource.

This results in the lesson failing dismally.

The result is that the teachers tend to bring in resources themselves, but find it very taxing to do this for every topic.

The medium of instruction in both schools is English. In School A, a dichotomy exists between the home language and the medium of instruction at school. Prior to the elections, this school catered for a particular group of pupils. Since the first democratic elections, the school has opened its doors to all race groups, which meant that many of the children from the neighbouring township have chosen to attend this school. There may be many reasons for this, one being that parents perceive this school to have better facilities than the schools in the township.

The problem however is that pupils who previously attended a township school, were taught mostly in the vernacular and therefore language in their present school may act as a barrier to learning. This is an added challenge that faces teachers.

5. Resources

Looking at resources within the school and in the community. This includes physical and human resources. Another distinction that needs to be made is (1) resources within the school, which is not used in class and (2) those used within the classroom.

In terms of delivering the curriculum, the facilities that teachers have at school A in comparison to School B to facilitate their teaching, does differ in quality and quantity. Reference will be made to (1) resources available to teachers in the classroom, (2) resources in specialist rooms, (3) human resources and (4) other resources.

5.1 Classrooms

Although Teacher 1 at School A has sufficient tables and chairs for her pupils, teacher 2 who teaches grade 5 pupils does not have sufficient space for all of her 43 pupils. Some of them sit two at a desk. The quality of the furniture is also dismal. Some of the chairs are broken as well as the desk tops are in need of repairs. The school does not have the funding to repair what can be repaired and replace what needs to be replaced. Teachers say they make do with what they have.

Without the basic facilities, it is impossible for the teacher to create a site that is conducive to learning. It is not a very stimulating environment. In School B there are no problems with furniture. Classes do not lack basic facilities such as desks and chairs, additionally to enough chairs and desks and sufficient storing facilities, these teachers have an overhead projector and shelves filled with books.

5.2 Specialised rooms

School A does have a library, but as the Education Department buckles under financial constraints, no new or additional books have been forthcoming. There is no librarian and the teachers describe the library as being in a very poor condition.

School B, has excellent facilities to facilitate learning. They have a functional library with a fulltime librarian. Teachers can approach the librarian with a request to make available books and other literature on a particular topic they would like the pupils to research. Furthermore the school boasts a computer room that pupils can use when doing a project or research. They have access to Internet and use their computer lessons to find information on environmental issues being dealt with at the time.

5.3 Human Resources

This is probably the most important resource. Being able to bargain on the support of other colleagues and management staff, can ease things considerably for the classroom teacher. In the event of needing to take pupils on a fieldtrip, or to acquire some resources for a project, the teachers of school B can always count on the support of the principal. Teacher 2 from this school is busy with plants and how they grow and produce food. Over the next couple of weeks they will be planting seedlings. She has had no problem in getting growing mix, growing pots and seedlings. When it comes to seeking advice from colleagues, they can rely on support from those spheres as well. The teachers from School A enjoy limited support. It would appear as if other staff members are too caught up in their own problems, to lend a sympathetic ear. Management on the other hand are willing to assist, but due to limited financial resources, they are unable to meet all the requests of teachers.

The result is that if the teachers want to take their pupils on a field trip they rely on the support of the parents to pay for their child. This is not always forthcoming.

5.4 Other resources

In the instance of teaching environmental education, the school garden becomes an invaluable resource. In the instance of School B the excellent state of the garden and school grounds have been described. The grade 6 teacher has also been able to secure a section on the school ground, which she and her pupils will use as a vegetable garden. They are able to do first hand investigations on the crops they grow. This is impossible in school A. Even if they would be able to secure a section and get vegetables to grow, the garden will be raided by other pupils or by the community over weekends.

In this particular research where one of the critical questions that I would like to answer is whether the resources context of a school affects the extent to which teachers integrate environmental education into the syllabus, it becomes necessary to scrutinize the resources in a school and compare them with one another. It also becomes important to see what each school attempts with regard including environmental education, and to find a link with the resources available to teachers.

The next section will look into this.

6. Curriculum delivery

The curriculum is prescribed by the Department of Education, and schools do not have much flexibility in how they deliver the curriculum to meet the needs of their pupils. It is however up to schools how they manage the curriculum.

In the instance of the two teachers who teach grade one pupils, they are engaging in the new outcomes based education (Curriculum 2005). The curriculum is organised into three learning programmes, namely (1) Life Skills, (2) Language, Communication and literacy and (3) Mathematics and Maths literacy. There are 66 outcomes that need to be covered in the first three years. To assist teachers in their planning and to give them a focus, there are six phase organisers of which the Environment is one. It is possible to integrate various environmental issues into each of the three learning programmes. It becomes an integrated curriculum. Both teachers are following the new curriculum, but teacher 1 from School A admits that she does

tend to fall back on the old familiar curriculum. Lesson planning and preparation takes up a lot of time and to manage 43 pupils, does add to the burden.

Teacher 1 from School B, who also engages in curriculum 2005, identifies themes that run over a period of two weeks. Depending on the theme various activities are identified. These are linked to outcomes. They try as far as possible not to do the same outcomes if pupils have demonstrated mastery over them. It depends on the theme whether environmental education is included.

Both teachers who teach at the senior primary level have also adjusted their approach to teaching. Teacher 2 from School A who teaches at grade 5 level, is involved in class teaching as opposed to subject teaching. She is responsible for teaching her class in all the subject areas. There are advantages and disadvantages to such an arrangement. It is not in the ambit of this research to go into them, but to mention that it places the teacher in a good position to integrate environmental education across the curriculum. The reverse is also possible. If the teacher should have no interest in environmental issues, this aspect of education may be neglected.

Teacher 2 from School B is in a similar position in that she is also responsible for teaching her grade 6 class in all the subject areas. She however does it with a difference. She teaches them English, Maths and Science as separate subjects, but when it comes to the rest they are grouped together as Environmental Studies. This is the first year that they are delivering the curriculum in this way. They have identified various topics or broad themes into which they incorporate Mathematical skills, Language skills and Science skills. Some of the themes covered include, poisons in the home, correct use of pesticides, global warming, water, acid rain and recycling.

7. Classroom practice

7.1 Inclusion of environmental education

Teacher1 from School A sometimes includes environmental education in her teaching but as stated in the interview with her she was not putting in enough time and effort. At present she is concentrating on other aspects of the syllabus that is a priority at this stage. She also mentions that she feels she doesn't know enough.

She chooses topics that pupils can relate to. Aspects they are in contact with every day. Hence the reason for choosing weather conditions as the topic for her lesson.

Another contributing factor why environmental education is not always included is class size and the difficult nature of the pupils. It is probably easier to do structured work to get them used to routine to curb some of the behavioural problems.

Teacher 1 from School B always integrates environmental education into the curriculum. She has a different viewpoint as to what environmental education is than the teacher from School A. She describes it as “things that are happening in their world around them.” The teacher from School A tends to narrow it down to “it refers to where I live, my surroundings, my natural surroundings actually.”

Teacher 2 from School A and teacher 2 from School B, who are both teaching in the senior primary section of their school, often integrate environmental education into their curriculum.

Due to the content driven nature of syllabuses they need to cover they tend to include environmental topics that fit in with the syllabus topic. This may be seen as inclusion or adding on to the current syllabus. Time constraints to complete the prescribed syllabus may curb the extent to which topics are included and the strategy used to include them.

7.2 Environmental Topics and Strategies

A distinction needs to be made between:

(1) strategies in the questionnaire where they had to indicate which of the strategies they use and how frequently they use them, (2) those that were actually used in the lessons that were observed and (3) a third category of topics and ideas that they had done previously or plan to do in future.

7.2.1 Strategies identified in the questionnaire

The junior primary teachers mentioned that the interests of their pupils largely determine the environmental topics that they choose, whereas in the senior primary phase, teachers are driven by a content laden syllabus and integrate environmental issues into the curriculum if time permits and the topic lends itself to inclusion.

When comparing the kinds of aspects covered by the grade one teachers, it was evident that they always opt for recycling and also tend to make use of magazines and newspapers when they are teaching environmental issues. The teacher from School A listed as sometimes doing arbour day, but in the interview she states: “we include arbour day where the children actually go out and they look at the trees. You come back and you can draw something you saw outside.”

Both teachers are in unison when they agree that they never use lecturing as a way of bringing in an environmental issue into the curriculum. This may also be the result of their clientele. Lecturing is not an effective teaching method for pupils of this age.

On the other hand teacher 2 from School A, who teaches grade 5 pupils, often uses this method whilst the teacher 2 from School B sometimes uses lecturing as a strategy.

The kinds of topics covered by the senior primary teachers include high on their list, waste management and arbour day. Recycling and fieldtrips are also mentioned. Whereas the teacher from school B lists the frequency for going on fieldtrips as always, the teacher from School A rates it as often. The reason for this is found in the interview where the teacher mentions: “You cannot have too many excursions and even if you do have an excursion, the parents have to pay.”

Additional to this the teacher mentions the number of pupils as being problematic. As she says there are between 43 and 45 pupils in the grade 5 classes and there are, four sections, it adds up to a large number to control on any excursion. She elaborates by saying that the majority of their pupils

seldom go anywhere (even with their parents) so when they go on a school trip, no constructive learning takes place. Pupils tend to be very noisy and behave different outside of the classroom as they normally would in class. The result is that a large group such as this is taken out on an excursion to places where little educational value is found. It is mostly for recreation.

Teacher 2 from School B mentions that arbour day is a special day, and that they have a ceremony at school where a tree is planted. They also have an assembly on arbour day awareness. Teacher 2 from School A mentioned that previously they had made quite an event of arbour day. They would have art competitions and each class would have a tree to plant. Now the principal may just mention at assembly that it was arbour day. She ascribes this to the fact that the staff then, was not under such strain. She also mentions that with a special day such as arbour day or water week, this would be seen as an opportunity to do something different in class.

Making posters and showing videos featured high on the lists of the two senior primary teachers.

What is further apparent is that both teachers from School A tend to have the water audit and water quality testing lower down on their lists. One of the teachers mentioned that water audits and testing for water quality was not done due to a lack of equipment.

Teacher 1 from School B in her interview mentioned doing experiments with her grade 1 pupils on water and that they had constructed a water filter using sand and stones.

7.2.2 Strategies used during class observations

Teacher 1 from School A, taught the seasons and weather conditions. When asked why she chose this topic she stated that it was easier for the pupils to relate to weather conditions. She was asked how she decided on environmental topics to include. Her most important criterion for making a choice between various environmental issues, are her pupils. They guide her. She uses what they can physically see every day. Aspects relevant to

them in their everyday lives.

Teacher 2 from School A during the first observation revised water and health, conservation of water and uses of water. In the second lesson observed, the theme was “Our Country and Globalisation”. When appropriate she will include an environmental message in the lesson. During this particular lesson, the syllabus content she wanted to familiarise the pupils with, was the globe. She showed them the continents, the oceans, equator and the North and South Poles. The environmental message that she brought across in this context was what was done in one part of the world has an effect across the globe.

In her Teacher’s diary she made reference to a lesson on water recycling.

Teacher 1 from School B was at the time busy with a theme on elections. The most important criteria that she uses in choosing her themes are that they must be (1) relevant to the pupils and (2) topical at that point in time. If it so happens that the topic relates itself to the inclusion of environmental education, then it is done. In this particular lesson, pupils were acting out the voting procedure. With that come important social lessons. The protocol followed when voting, was highlighted and pupils learnt about elections that are fair.

Teacher 2 from School B in similar fashion as teacher 2 from School A, is guided by the syllabus. Should the syllabus lend itself to the inclusion of environmental education, she then brings it in. The lesson observed was on plants and how they produce and store food. She started off the lesson by asking them where they got their food. Guiding them to plants as producers.

7.2.3 Other Strategies and Topics

These include topics that the teacher had done previously or still plans to do.

Teacher 1 from School A looks at animals, in particular the earthworm, and the important role they play. The sun as a source of heat. Flowers is another topic. Teacher 1 from School B makes reference to water pollution, conservation, the study of wetlands as additional topics that they do. They previously looked at the conservation of the crane, but may choose something different this time.

Teacher 2 from School A has previously done a litter survey in Maths. It would depend on the syllabus content. She however mentions that teachers need training in how to include environmental education into the curriculum.

Teacher 2 from School B has given a whole list of topics. As previously mentioned, these are done in Environmental studies. She refers to the following topics in addition to those mentioned previously: Poisons in the house, pesticides in the home and garden, and global warming.

7.3 Teaching Methods

The question that needs answering in part here is: How do they go about including the topic into their lesson?

The focus will be on teaching methods and other strategies teachers adopt to integrate environmental education into the curriculum.

Teacher 1 from School A tends to favour story telling, alternating with the asking of questions that lead into discussions. In the lesson on seasons she was asked how she brought in the topic into her lesson. Her response was that she started by discussing the weather conditions of that day and that of the previous day. From there it just flowed into the actual part of the lesson she wanted them to understand, being the different weather conditions.

Teacher 1 from School B tends to follow an activity-based approach. This is interlinked with discussions and questioning sessions throughout the lesson. The activities pupils engage in would depend on the context they use and the outcomes they want to achieve.

Teacher 2 from School A uses a variety of teaching methods such as chalk-and-talk, which is alternated by story telling, asking questions and class discussions. Some of the questions require problem solving from pupils. This is done as a whole class. The result is that not all learners take part in the discussions. They may just be passive listeners. To elaborate on a point she used relevant everyday examples to which they can relate. The old skill of repeating facts (drill) was skilfully done.

My observation of Teacher 2 from School B revealed that she uses a deductive approach to lead the pupils to the actual aspect of the lesson that she wanted them to know. She makes use of questions and discussions both in groups and as a class, to involve learners.

8. Summary

The two schools were compared by looking at the profiles of the schools, teachers and learners. The resources in each of the schools were looked at as well as curriculum delivery and classroom practice. All of which was aimed at extracting the relevant evidence with which to answer the research question in the following chapter.

CHAPTER 6

SYNTHESIS, RECOMMENDATIONS AND CONCLUSIONS

1. Introduction

Agenda 21, in a document by UNCED 1992), proposed that strategies needed to be developed to integrate the environment as a cross-cutting issue into education at all levels. (Camozzi 1994).

This task may seem more difficult than anticipated. The introduction of environmental education into the curriculum presents teachers with a challenge because the pedagogic underpinning environmental education is in conflict with the traditional approaches to teaching and learning.

This final chapter will consider all the evidence and then attempt to state (1) whether teachers are integrating environmental education into the curriculum, (2) how they integrate environmental education into the syllabus, (3) how they justify the ways in which they integrate and (4) the extent to which the availability of resources influence the integration.

2. Synthesis – Outlining the case

Teachers taking part in the research, both the surveyed and interviewed respondents, are an experienced group. 69.2% had ten years or more teaching experience. 61.5% were female and 38.5% were male. All the interview respondents were female.

Looking at the academic background of respondents, it would appear as if the majority had a teaching diploma qualification. 69.2% had a higher education diploma, whilst 14.14% had a degree. Of the respondents 84.6% attended a college of education. The respondents majored in a combination of subjects, mathematics, as a major, tends to stand out above the rest.

The research was carried out in primary schools. Of the schools, 7.7% were junior primary, 46.2% senior primary and 46.2% were combined junior and senior primary schools.

Of the subjects being taught, 69.2% of the teachers teach all the subjects (class teaching). 53.8% of the classes have between 30 and 40 pupils in a class, 23.1% have between 40 and 50 pupils per class and 23.1% have between 20 and 30 pupils per class.

Looking at the facilities at schools, the following is apparent:

All the schools have water, electricity and a photocopier. 92.3% have a telephone and 84.6% a fax. 76.9% have sufficient desks and 92.3% have sufficient chairs for the pupils.

Looking in terms of technology, 92.3% have a typewriter, 76.9% have a computer whilst 15.4% have access to Internet. 61.5% have a television and a video.

The classroom scenario reveals that, 92.3% have sufficient text books for learners and all have exercise books. 76.9% have an overhead projector. This however does not mean that the teacher has exclusive rights to it as some schools only have one overhead projector for the whole staff.

Looking specifically at environmental education, 46.2% have an environmental education policy of which 30.8% say that their policy is good and 23.1% rate their policy as being poor to very poor. 46.2% of the respondents did not respond to this question.

7.7% do not integrate environmental education into the curriculum. All respondents feel confident when integrating environmental education into the curriculum and 53.8% rate their confidence as high. All feel competent to integrate and 61.5% rate their competence as being high.

76.9% however feel that they need more training in integrating environmental issues into the curriculum.

The survey revealed that the teachers used the following strategies when teaching environmental education:

53.8% always use Magazines, 46.2% sometimes use fieldtrips, 38.5% always to often use newspapers, 38.5% make use of role play (simulation) and the making of posters, 30.8% always to sometimes make use of pupil investigations whereas 7.7% seldom use investigations, 38.5% never use lecturing as a strategy and 30.8% always use lecturing to teach environmental education. 30.8% never invite guest speakers to come and speak to their

pupils on environmental issues and 23.1% would sometimes invite a guest speaker.

The respondents rated the environmental topics that were given in the questionnaire as follows:

61.5% use recycling as a topic to teach about the environment, 46.2% often use waste management, 38.5% often to always include Arbor Day, 30.8% often use ecology studies whereas 23.1% seldom use it. 30.8% sometimes engage in doing a water audit and 7.7% never do it, whereas 38.5% never include water quality as a topic in their curriculum whereas 15.4% always do.

How do teachers see the purpose of teaching environmental education?

All respondents feel that the teaching of environmental education should not only inform pupils, but it must result in pupils taking action. 76.9% strongly agreed with this statement and 23.1% agreed and to the statement that environmental education should only create an awareness of the environment amongst learners, 69.2% disagreed and 23.1% strongly disagreed. 69.2% strongly disagree that it is a waste of time to teach environmental education whereas 30.8% disagree with the statement that it is a waste of time to teach.

Respondents were also asked for their opinion of who should (or should not) teach environmental education. Contrary to what the literature has revealed, 53.8% disagree and 46.2% strongly disagree that it should be taught in science. 53.8% strongly agree and 38.5% agree that it should be taught across the curriculum as opposed to 15.4% that strongly feel that it should be taught as a separate subject. Teachers felt that that it should be taught by teachers that were interested in the field. 46.2% agreed with the statement, 38.5% disagreed with it and 7.7% were undecided.

It is widely advocated in the literature and also in the Tbilisi report that experiences in environmental education should be activity based, first hand experiences (Camozzi 1994). 46.2% sometimes engage in activity based learning sometimes and 38.5% engage in it most of the time and 15.4% engage in activity based learning all the time.

3. What is the verdict? – Does the data answer the research question?

There seems to be no doubt that teachers are integrating environmental education to a more or lesser extent into the syllabus. They rate their confidence and competence in doing so as high.

The data does answer the research question to an extent. Other implications have also been revealed.

Critical question 1 – The data revealed that teachers used a great variety of methods, strategies and topics to integrate environmental education into the curriculum. Some strategies are used to a greater or lesser extent than others. Reasons for this may differ but in the case of the water quality test, teachers mentioned that the lack of resources prevented them from doing it. In interviews with teachers it was revealed that the kind of methods, strategies and topics that they used depended on various reasons. This will be looked into in the next section.

Critical question 2 – Looked at the reasons given by teachers for using certain strategies. The most apparent reason given by the junior primary teachers was that it would depend largely on the interests of the pupils. Consideration is also given to aspects such as relevance and the developmental level of the pupils. Everyday tangible aspects seem to be most popular.

On the other hand, the most dominant reason for senior primary teachers' choices to integrate and environmental aspect into the curriculum depended entirely on the syllabus. The syllabus dictated to a large extent what environmental aspect teachers would do.

Critical question 3 – The research did reveal that the lack of resources did affect the extent to which teachers integrated environmental education into the syllabus. Finance seemed to be the primary culprit. In the same instance it must however be mentioned that this is not the only obstacle that teachers face, resources are but one and the evidence given in this study does not irrevocably prove that the lack of resources, prevent teachers from integrating environmental education into the syllabus. On the contrary teachers mentioned that they make do with what they have. It could rather be stated that the culmination of the effects of various limiting factors of which resources is one, limits the extent to which teachers integrate environmental education into the curriculum.

It is with this in mind that certain recommendations are made.

4. Recommendations

The first of the recommendations are for teachers and schools who are, or wish to, integrate environmental education into the curriculum.

The first being that environmental education should permeate the whole curriculum both inside and outside the school. Hand in hand with this is that efforts should be made to co-ordinate the total programming of environmental education (Camozzi 1994).

In primary schools, environmental education is seen as involving pupils in personal experiences with the environment. Using all their senses, the emphasis should be placed on the developing and deepening of concepts. Teachers must be aware of the dichotomy that exists between the teaching of environmental education and traditional teaching. This is especially so for the day-to-day classroom management. Environmental education advocates first hand experiences and is activity based. This brings with it the need for creative and effective ways to maintain order and control. This is made more difficult with the size of classes at present.

The learning environment within and outside the classroom needs to reflect the attitude and values that the school's environmental programme advocates.

Additional recommendations are for researchers. For many teachers the criteria on which they base their decision for particular pedagogical strategies include not only resources, but also class size, time constraints, other priorities and overburdened timetables. Another is a lack of knowledge and training in environmental education.

It is suggested that researchers take a critical approach as specified by Robottom and Hart (1993) when researching environmental education. They need to find out if environmental programmes are effective and to what extent do the factors as specified above, influence the integration of environmental education into the curriculum.

It would appear as if teachers are working in isolation when it comes to environmental issues. There seems to be lack of direction. No environmental education policy that guides all teachers within an institution. It seems to be left over to the devices of individual teachers who happen to have an interest to teach it.

5. Conclusion

This study set out to find answers to the research question: how teachers integrate environmental education into the curriculum. This was achieved. The fact that teachers are teaching pupils about the environment in a variety of ways is of no re-assurance however. The constraints that teachers face in the implementation are a grave concern and the lack of coherency with which it is integrated in schools another major concern. Even though one feels relieved that teachers are teaching it, the question arises if the goals of environmental education, as depicted by the Tbilisi declaration, are being realised:

- ‘(1) to foster clear awareness of, and concern about, economic, social, political and ecological interdependence in urban and rural areas,
- (2) to provide every person with opportunities to acquire the knowledge, values , attitudes , commitment and skills needed to protect and improve the environment, and
- (3) to create new patterns of behaviour of individuals, groups and society as a whole towards the environment.’ (Camozzi 1994).

The concern is that the teaching in many instances is incidental or an extension to a syllabus topic. It never becomes the focus.

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Appendix A

INTEGRATING ENVIRONMENTAL EDUCATION INTO THE CURRICULUM
TEACHER QUESTIONNAIRE

SCHOOL CODE_____

DATE_____

DISTRICT_____

CIRCUIT_____

A) PERSONAL INFORMATION

SUBJECTS TAUGHT			
GRADES TAUGHT			
NO OF LEARNERS			

KINDLY MAKE AN X NEXT TO THE APPROPRIATE RESPONSE

TYPE OF SCHOOL

Junior Primary ☐
Senior Primary ☐

INDICATE YOUR GENDER

Male ☐
Female ☐

KINDLY MAKE AN X ACROSS THE APPROPRIATE BLOCK TO INDICATE THE NUMBER OF YEARS OF TEACHING

LESS THAN 1 YR	1 – 5 YRS	6 – 10 YRS	10 OR MORE YRS
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QUALIFICATIONS

Highest qualification subjects	Year obtained	Institution obtained	Major
		College University	

ACADEMIC			
PROFESSIONAL			

Confidential

What position do you hold at school? Mark the appropriate block with an X.

Teacher ☐ HOD ☐ Deputy Principal ☐ Principal ☐ Phase head ☐

RESOURCES WITHIN THE SCHOOL

INDICATE TO WHICH OF THE FOLLOWING YOU HAVE ACCESS IN YOUR SCHOOL
AND IN WHAT CONDITION THESE RESOURCES ARE.

	YES	NO	V. GOOD	GOOD	POOR	V. POOR
SCHOOL LIBRARY						
STORE ROOM						
SCHOOL GROUND						
TELEPHONE						
FAX MACHINE						
TYPEWRITER						
PHOTOCOPIER						
COMPUTER						
ACCESS TO INTERNET						
FILM PROJECTOR						
ELECTRICITY						
PIPED WATER						

MENTION OTHERS:				

INDICATE WHICH OF THE FOLLOWING RESOURCES YOU USE IN THE
CLASSROOM AND INDICATE IN WHAT CONDITION THEY ARE.

	YES	NO	V. GOOD	GOOD	POOR	V. POOR
TEXT BOOKS						
EXERCISE BOOKS						
OVERHEAD PROJECTOR						
AUDIO TAPES						
AUDIOTAPE PLAYER						

WALL CHARTS						
TELEVISION AND VIDEO PLAYER						
CHALKBOARD						
CHALK AND DUSTER						
EE POLICY						
SCISSORS						
PAPER						
CRAYONS						
GLUE						
TEACHER CUPBOARD						
SUFFICIENT DESKS FOR LEARNERS						
<u>SUFFICIENT CHAIRS FOR LEARNERS</u>						
DISPLAY OF LEARNERS WORK						
OTHERS:						

DO YOU INTEGRATE ENVIRONMENTAL EDUCATION INTO YOUR CURRICULUM? INDICATE YOUR CHOICE WITH AN X IN THE APPROPRIATE SPACE.

	ALWAYS	OFTEN	SOMETIMES	SELDOM	NEVER
I FULLY INTEGRATE EE INTO MY CURRICULUM					
I FIND IT DIFFICULT TO INTEGRATE EE INTO MY CURRICULUM					
EE IS ONLY INTEGRATED INTO SCIENCE LESSONS					
I DO NOT INTEGRATE EE INTO MY CURRICULUM					

Are you confident in integrating environmental issues into the curriculum? YES ☐ NO ☐

How would you rate your confidence to teach environmental issues?

Very High ☐ High ☐ Uncertain ☐ Low ☐ Very Low ☐

Do you feel competent to teach environmental education?

Very High ☐ High ☐ Uncertain ☐ Low ☐ Very Low ☐

How would you rate your competence to teach environmental education?

Very High ☐ High ☐ Uncertain ☐ Low ☐ Very Low ☐

Have you attended any workshops on environmental education in 1998? YES ☐ NO ☐

Did you find the workshops useful in your teaching?

Very useful ☐ Useful ☐ Uncertain ☐ Useless ☐ Very useless ☐

Do you require more training on environmental education? YES ☐ NO ☐

**INDICATE WHETHER YOU USE ANY OF THE FOLLOWING
STRATEGIES WHEN INTEGRATING EE INTO YOUR CURRICULUM.
INDICATE YOUR CHOICE WITH AN X IN THE APPROPRIATE SPACE.**

	ALWAYS	OFTEN	SOMETIMES	SELDOM	NEVER
WATER AUDIT					
WATER QUALITY TEST					
WASTE MANAGEMENT					
ARBOR DAY					
ECOLOGY STUDIES					
CYCLING PROGRAMME					
PROJECTS					
COMPETITIONS					
MAGAZINES					
NEWSPAPERS					
FIELD TRIPS					
PUPIL INVESTIGATIONS					
ROLE PLAY					
POSTER MAKING					
GUEST SPEAKERS					
LECTURING					
ENVIRO CLUBS					
SHOWING VIDEOS					

OTHER:					

CONFIDENTIAL
CONFIDENTIAL

F) **How are learners seated in your classroom?** ☐ Groups ☐ Rows

How often do you provide activity based learning to learners?

Not at all ☐ Sometimes ☐ Most of the time ☐ All the time ☐

How often do you provide learners with the opportunity to demonstrate what they have learnt?

Not at all ☐ Sometimes ☐ Most of the time ☐ All the time ☐

G) DO YOU GET SUPPORT WHEN INTEGRATING EE INTO YOUR CURRICULUM FROM:

	ALWAYS	OFTEN	SOMETIME S	SELDOM	NOT AT ALL
EDUCATORS AT YOUR SCHOOL					
PRINCIPAL AND MANAGEMENT					

HOW DO YOU VIEW ENVIRONMENTAL EDUCATION? MARK THE APPROPRIATE BLOCK WITH AN X.

	STRONGLY AGREE	AGREE	UNDECIDED	DISAGREE	STRONGLY DISAGREE
SHOULD BE TAUGHT BY SCIENCE TEACHERS ONLY					
SHOULD BE TAUGHT BY TEACHERS WHO ARE INTERESTED					
SHOULD NOT ONLY INFORM LEARNERS BUT LEAD TO ACTION					
SHOULD BE TAUGHT ACROSS THE CURRICULUM					
IS A CULTURAL SUBJECT					
IS A WASTE OF TIME					
SHOULD ONLY CREATE AWARENESS OF THE ENVIRONMENT					

DID YOU RECEIVE DEPARTMENTAL CIRCULAR NO 11 OF 1998 ON

ENVIRONMENTAL EDUCATION?

YES	NO
-----	----

IF YOU STATED “YES” ABOVE, INDICATE FROM WHICH SOURCE YOU

RECEIVED THE CIRCULAR.

SUPERINTENDENT EDUCATION MANAGEMENT	
SCHOOL PRINCIPAL	
EE WORKSHOP	
OTHER (MENTION)	

Thank you for your contribution and time in completing the questionnaire.

HOW TEACHERS INTEGRATED EE INTO THE CURRICULUM
SEMI-STRUCTURED POST-OBSERVATIONAL INTERVIEW

SCHOOL _____

DATE _____

TEACHER _____

GRADE _____

INTERVIEW NO _____

SUBJECT / LEARNING AREA _____

TOPIC _____

QUESTIONS

1. What section of the syllabus did you cover?
2. What concepts did you plan to teach?
3. What do you understand by environment and environmental education?
4. What particular aspect of the environment did you cover in the lesson?
5. Why did you choose this aspect?
6. Did the availability of resources play a role in your decision to include this aspect?
7. Would you have rather done something else, but did not have the required resources?
8. Does your scheme of work indicate where and when you include environmental issues in your lessons? (Do you plan the event?).
9. How did you bring the environmental topic into the lesson?
10. Do you feel confident when integrating EE into the main curriculum?

11. Do you feel competent to integrate EE into the main curriculum?

Appendix C

HOW TEACHERS INTEGRATE EE INTO THE CURRICULUM

LESSON OBSERVATION SCHEDULE

SCHOOL _____ DATE _____

TEACHER _____ GRADE _____

OBSERVER _____ NO OF LEARNERS _____

OBSERVATION NO _____ SITE _____

DURATION OF LESSON/OBSERVATION _____ START _____

END _____

SUBJECT / LEARNING AREA _____

TOPIC _____

Variety of **teaching methods**? Tick appropriate block.

4	3	2	1
Teacher uses more than 2 methods, all involve learners	Teacher uses 1 or 2 methods that involve learners	Teacher uses 1 or more methods that do not involve learners	Teacher uses one method that does not involve learners

Tick methods used.

Interactive		Discussion (class or groups)	
Chalk-and -talk		Group work	
Individual		Lecture	

Use of **materials** by the **teacher**

4	3	2	1
Uses more than 2 kinds of materials	Uses 2 kinds of materials	Uses 1 kind of material	Uses no materials

Description _____

Use of materials by learners

4	3	2	1
Learners share and all manipulate materials in groups/pairs	Most learners share and manipulate all material	Some learners manipulate others watch	None of the learners manipulate material

Description _____

Grouping of learners

4	3	2	1
Uses flexible groups and assigned roles	Uses groups flexible without assigned roles	Uses permanent groups with or without assigned roles	No groups

Description _____

Working in groups/pairs.

4	3	2	1
Groups discuss problems, questions and activities	Groups have limited interaction	One or two learners in a group interact	Learners sit in groups but work individually

Description _____

Critical and creative thinking

4	3	2	1
Ls involved in discussions, problem solving or creative activities	Ls involved in sharing ideas	Ls involved in teacher-directed activities	Teacher lectures, learners listen

Description _____

Teacher Questioning skills

4	3	2	1
T asks a variety of Qs, including open-ended Qs that probe understanding	Asks mostly close-ended Qs and 1 or 2 open-ended Qs	Asks simple recall Qs only or close-ended Qs	Asks no Qs

Description _____

Learner Questioning skills

4	3	2	1
Ls ask Qs which show creative thinking even without teacher encouragement	Ls ask Qs that show their thinking only when the teacher encourages	Ls ask simple Qs only	Ls ask no Qs

Description _____

Feedback to learners

4	3	2	1
Feedback about correct and incorrect responses in a manner that encourages further effort	Feedback about incorrect responses only, in a manner that encourages further effort	Feedback about correct responses only	No feedback or feedback that discourages further effort

Description _____

Language used

4	3	2	1
Integrates English and home-language consistently	Uses code-switching only when majority does not seem to understand	Communicates only in English even when majority of Ls do not understand/discourages use of home-language	Uses home-language only

Integration of environmental education

4	3	2	1
Fully integrates EE into the lesson as a theme or topic	Links syllabus content to an environmental topic or issue	Includes EE as an extension to the lesson content	No evidence of including EE

Description_____

What environmental issue was included in the lesson?_____

How was the environmental issue integrated into the section of the syllabus (lesson)?

Discussion	Class exercise	Poster making
Quiz	Project	Video
Specify other:		

Describe the atmosphere that prevailed throughout the lesson.

Write down the resources the teacher used and how they were used.

Draw a plan of the classroom to indicate the seating of learners, the teacher’s desk and the chalkboard.

Overall Impression

Indicator	4 Not at all	3 Sometimes	2 Several times	1 All the time
Students work actively in groups				
Learning is activity based				
Teacher integrates an environmental issue into the learning experience				
Teacher asks questions				
Learners ask questions				
Teacher provides learners with individual feedback				
Learners have opportunity to demonstrate what they learn				

Indicator	4 Not at all	3 Sometimes	2 Several times	1 All the time
Learners taken outside of classroom for related activity				
Topic and activities relevant to learners context				
Resources used effectively				
Learners constantly interact with the teacher				
Materials and equipment provided a wide range of experiences				
Learners engage in hands-on activities				

Attach samples of learner's work.

TEACHER'S DIARY

When making an entry please include the following information:

A)

1. Date
2. Grade
3. Subject
4. Topic
5. No of learners
6. Duration of lesson
7. Time of lesson

B)

1. What you planned for the lesson from an environmental education point of view.
2. Reflect on the lesson:
 - State what worked well and what you would do differently next time.
 - What environmental aspect / issue did you include in the lesson.
 - How did you go about including this environmental aspect?
 - What resources did you use during the lesson and what significance did they have w.r.t. the environmental topic.

NOTE:

Please try and make a daily entry until the 31 of May. If you teach more than one subject, please alternate the entries so that each subject is included. Please reflect on the lessons I observe.

SCHOOL PROFILES

SCHOOL A

A) HISTORICAL CONTEXT

School A is a Primary school in the North Durban District of the Province of KwaZulu-Natal, South Africa. The school was a previous, House of Representative school, which catered for coloured learners in the area. Since before the first democratic elections in 1994, the school was opened to all race groups. Since the school borders on the KwaMashu Township, many learners from the township now school here. The staff is predominantly coloured.

B) TYPE OF SCHOOL

School A is a primary school and caters for learners from grade 1 to grade 7. On average the classes are 44 pupils in size. The medium of instruction is English, although for the majority of learners this is their second language.

C) FACILITIES AT THE SCHOOL

The facilities mention here are within the school and not in the classroom. Teachers however do have access to them.

The external appearance of the school is good. It is in a satisfactory condition. It would appear as if a few classrooms need minor repairs to them. There is a school ground, but it is difficult to maintain. It is evident from what the teachers say is that they have an increased litter problem and they described the general state of the school grounds as being very poor.

The school has electricity and piped water. The school has communication facilities such as a telephone and fax machine, which are both in working condition. The school office does have a computer, a typewriter and photocopier to which the teachers have access. Other resources such as the school library and storeroom are described as very poor. The school also has a film projector.

The following are resources within the school that the teacher can use in the classroom:

Textbooks are available but are in poor condition. All pupils have exercise books. Although the teachers do have access to audiotapes and an audiotape player, these are of a poor quality. There seems to be sufficient chalkboards and chalk. One of the teachers mentions that there is a television and video player. There are no overhead projectors. Wall charts are used. These are mainly acquired by the teacher or made by pupils.

The school does not have an environmental education policy.

Other utensils such as teacher cupboards, pupil desks and chairs is insufficient and in poor condition. Scissors, paper, glue and crayons are available.

SCHOOL B

A) HISTORICAL CONTEXT

School A is a Combined school in the North District of the Province of KwaZulu-Natal, South Africa. It is a private school and is open to all race groups. The majority of pupils are however white. The school is situated in a previously white suburb of Durban. The staff is predominantly white.

B) TYPE OF SCHOOL

School A is a combined school and caters for learners from grade 1 to 12. On average the class are 24 pupils in size. The medium of instruction is English.

C) FACILITIES AT THE SCHOOL

Facilities within the school, to which the teacher has access, but not necessary used in the classroom as such, will be referred to as well as facilities that teachers can use in their classroom.

The external appearance of the school is good. There is no evidence of maintenance that needs to be done. The painting is good and the gardens are regularly maintained and manicured. The furniture in the classrooms, although not new, is neat and well maintained.

The school has electricity and piped water. The school has excellent communication facilities such as telephone, fax and Internet and email facilities. School grounds are sufficient and well maintained.

Teachers have access to photocopying facilities, computers and typewriters. They do have a storeroom, which is in a very good condition. There is a film projector, audiotape player, audiotapes and a television and video player in a specialised room, the audio-visual room.

The resources that the teacher uses in the class room, includes text books, exercise books, an overhead projector, chalkboard, chalk and wall charts – all of which are described as being in very good condition. Resources such as scissors, paper, crayons and glue are available. The teachers do have a teacher's cupboard and there are sufficient chairs and desks for all pupils.

TEACHER PROFILES: SCHOOL A**TEACHER 1**

Gender : Female

Qualifications : Teaching Diploma obtained at a College of Education.
Major subjects are Needle work and Biology. This qualification was obtained in 1993.

Teaching experience : 5 years

Position at school : Teacher

She is currently teaching 40 grade 1 pupils. Teaching is outcomes based and integrated.

TEACHER 2

Gender : Female

Qualifications : Teaching Diploma (3 year). Major subjects are Art and History. This qualification was obtained in 1990.

Teaching experience : 8 years

Position at school : Teacher

She is currently teaching 43 grade 5 pupils. In this school, teaching is classroom based which means that the teacher is responsible for teaching the learners in all subject areas. There is no specialisation, where learners would be taught Mathematics by a Maths major and so on.

SCHOOL B: TEACHER 1

Gender : Female

Qualifications : Teaching Diploma. Major subjects are Remedial Education and Biblical Studies. This qualification was obtained in 1972.

Teaching experience : 26 existence

Position at school : Teacher

She is currently teaching 24 grade 1 pupils. Teaching is outcomes based and integrated.

TEACHER 2

Gender : Female

Qualifications : Public Relations at Technikon in 1984 and Teaching Diploma. Obtained at a College of Education in 1988. Major subjects were Computers and Mathematics.

Teaching experience : 10 years

Position at school : Teacher

She is currently teaching 24 grade 6 pupils. Teaching is classroom based and the teacher is responsible for teaching all subjects.

Transcription of the interview held with teacher 1 from school A.

For the purposes of the transcript, R refers to the questions posed by the researcher and T refers to the responses given by the teacher.

R What section of the syllabus did you cover in your lesson today?

T It was actually part of my life skills. And it was more to do with the weather and days of the week. That kind of thing.

R What concepts did you plan to teach them with the topic?

T Um. I taught them about the weather. Different kinds of days that we get. I told them a little story about how we get our rainfall.

R What do you understand by rainfall and environmental education?

T Okay, by environment um, to me it refers to where I live, my surroundings, um my natural surroundings actually. And um, environmental education is more to do um, the teaching of your natural surroundings. How to look after it – take care of it and so on.

R What particular aspect of the environment did you cover in the lesson?

T Um. The seasons. I like to tell them of the four seasons you get during the year. Um, types of weather conditions that you get. Rainy, windy, cloudy and sunny. Um, the children had to also draw to see if they could identify the type of picture with the type of weather condition.

R Why did you choose this topic?

T I felt it was easier for the children to um relate to weather conditions. And um, it is something that they see every day. They're in contact with it every day.

R Did the availability of resources play a role in your decision to include this aspect?

T Yes it did. But not all the time. Sometimes um, you have to make do with what you have. Or use pictures from books and that kind of thing to get through to the children. But if it's concrete and there is actually

R Would you have rather done something else but did not have the required resources?

T Yes, that happens quite often. Where you don't have resources to um carry out um certain parts of um the syllabus. Like when you do water you cannot do water surveys and stuff like that because we don't have the equipment.

R Does your scheme of work indicate where and when you include environmental issues

in your lessons – do you plan the event?

T Yes we have to plan. Everything for the year and the um scheme of work does include environmental issues. Not all the time. Some times it is incidental. But um there are certain things like when you deal with water, when we deal with pollution um the seasons, um, when the children actually had to construct something to make it um more environmentally friendly or something like that. Involves the aspects that are part of the syllabus.

R How did you bring the environmental topic into you're your lesson?

T We first discussed the weather condition for the day, weather condition of the previous day. Um and then we just linked it all up and it sort of just flowed until I got to the actual part of the lesson I wanted them to understand. Which was the different types of weather conditions that we do have throughout the year.

R Do you feel confident when integrating environmental education into the main curriculum?

T No not at all.

R In other words you've got enough knowledge with regard the environment to bring in.

T Um, I do have enough knowledge about the environment. I've been on the environmental group at school. But um, somehow I don't feel that I'm doing a proper job of it.

R What would the reason for [for] this be – you say that you are not doing a proper job. Why do you say that?

T Maybe because I am not putting in enough time and effort into my actual lessons concerning the environment. I'm concentrating on other aspects of the syllabus, which might be a priority at this stage, and um also because I don't feel I know enough. I do know a bit but not enough.

R But you're confident you've got enough knowledge to bring it into the lessons. You feel confident.

T Yes.

R Just getting back to that. Wouldn't it be that it is not always the focus and that is why you think that you're neglecting it? And if you say they do not understand it. But surely the message, the more you tell them, later on they become knowledgeable about the environment. Like this pupil who is sweeping the floor. That is an environmental lesson.

- T Yes.
- R We tend to think of environmental issues as doing a water audit and taking them out to the river.
- T Yes, and global warming.
- R And neglecting this (reference is made to the classroom and school grounds) as my first environment.
- T Yes. I think I tend to look at it like that.
- R And that is why you might feel that you are not doing enough because you are not tackling these other big issues. But surely with the six year olds, this is what matters to them.
- T Ja. I feel I am competent. No, in that aspect then I feel I am competent.
- R The question then is do you feel competent to integrate environmental education into the main curriculum.
- T Yes I do.
- R As you say it has to do with the immediate environment of these little children and from there you might go wider to the bigger global issues. But you must start small.
- R How do you go about planning topics during how do you make the choice between issues to include?
- T Well I go with what the children are. What they can physically see every day. Like today I used the weather because that is something they're in contact with all the time. Something that is relevant to them.
- R So you are choosing things that are relevant to their everyday lives.
- T Yes.
- R Because then it will make an impact?
- T Yes, it will be more meaningful.
- R What topics or issues do you normally include – if you think back over the year and even last year?
- T Um, we include arbour day, where the children actually go out and they look at the trees. You come back and you can draw something you saw outside. Um, we include our animals as part of the environment. Why do we have animals? Especially your earthworms and stuff like that. Why do you have them? Why you mustn't kill them. Um the water, um we spoke about heat. How we get our heat. Using the sun as a source and the importance of it. And a lot of the environmental work we did where the

children uhm... It was more artistic, you know where they actually make things and clothing and must. And just take in everything I was telling them. They were very involved when they went out and we had flowers, where we checked flowers last year. We had dried flowers, and then they were used in an art lesson – where they came to mother's day.

R So you would say that the environmental issue um wouldn't just be linked to one subject. It gets linked to art and other subjects. Also looking at special days such as arbour day and possibly during water week you do water.

T Yes.

R So you are looking at special days.

T Yes.

R And if they might raise a topic.

T Yes. I go with the flow of whatever I get from my class.

R Like when you go into pressing flowers.

T Yes.

R So there is basically three ways in which you are bringing the environment into the lesson.

T Yes.

R Because it is not a set subject you are teaching grade 1, which is a very integrated curriculum.

T You can bring the environment into your mathematics into your literacy, life skills. Sometimes we'll do reading and then someone will say. Um "but miss, he's wearing a jacket" and I'll say "why?" and then just looking at the picture from our reading passage we [we] end up doing something that's environmentally because maybe there's snow or a snowman or ... and then your reading now is put aside and you're going onto the picture.

R So you would say that you use the environmental topic sometimes as the glue to bring all these different learning experiences together in certain instances.

T Yes you can.

R As a theme?

T Yes as a theme. Ja.

R It could cut across languages, art, maths,...

T Yes. You can even do your phonics, where you've got the certain strands from the environment that comes in there. Words dealing with it. It's exciting, but I don't

spend enough time with it.

R You might not consciously think that you're spending enough time, but if you now think back on what you have been doing, then surely there is a kind of continual thread. There are planned things.

T Yes.

R There are special days.

T Yes.

R So you are integrating within various aspects so that it is so integrated that you don't recognise that you are doing it.

T Yes. I can see already that they are very conscious about littering and we've started with that aspect of becoming aware of the environment and looking after it. And that is

Transcription of the interview held with teacher 2 from school A.

For the purpose of the transcript, R refers to the questions posed by the researcher and T refers to the responses given by the teacher.

R What subjects do you teach?

T All the subjects.

R Would this include Maths, English ...

T Yes, Maths, English, Geography, everything.

R Can you think of examples of how you can include environmental education into these subjects – is it possible to do it in all of them?

T It depends on what the subject matter is at any given time. I may say that integrating it into Mathematics it is not easy to incorporate it. We have just completed a section in Maths on data handling where the children actually learn how to read graphs, learn how to make graphs, learn how to collect data. And it was interesting because you could have used different kind of things like litter on the playground that kind of thing. I know we did that last year but this time I used another example. They had to collect data on something else. So it depends, you can actually do that.

R So your main focus will be Maths but bringing in the environment as a vehicle to develop that skill.

T Yes.

R Any other subject that you can think of?

T Languages, yes. You can do it with languages. Um because for example there are – we did something today. We did collective nouns. We did collective nouns; they had to give me one word for a Willow, a Beech and a what was the other example? – um a Sycamore. You understand. So you can bring it in. You can. You can speak about indigenous trees and exotics. So you can.

R What other ways can you bring environmental education into the classroom? Lets say not specifically a subject. Um do you think – special days like arbour day?

T Oh yes. I find that uh previously when we weren't under such strain um the staff as a whole, we used to make quite an event about arbour day. We would have art

competitions about different class efforts with the art. We would go out. Every class would have a tree to plant and so on. But I find that as the years are going by it is just as if the teachers um the principal would come and announce in assembly that it was arbour day today. Oh and that's it.

R So in the lesson now let's say it is arbour day – water week. Would you see that as an opportunity to do something?

T Yes it does. Ja. You not only inform the child. The child also gets it through the media and so on.

R But would you say being in senior primary where you have specific subjects, is it not too difficult to bring in themes that time of the year as you may not be doing water then.

T Uh what we normally do is if we go through something like that um what we normally do is to say this is water week because we've got an environment committee at school and they will say something about it at assembly and then we'll get together as a grade and a grade leader or the teacher on charge of the science work sheets. Well it is water week, we are supposed to do water in lets say the third term, but we'll do it now.

R So you basically shuffle the syllabus to fit in. Do you think that the lack of resources hampers your integration of environmental education into the curriculum?

T Yes it does, yes. I think our major lack of resources is finance. And I don't just mean finance in the school. I am also talking of the finance in the childrens' homes. Because of the environment we are teaching in the socio-economic climate is not good at all. You'll say Newlands East go and look at the tadpoles that kind of thing and speak about the environment. There is a dump right near here, but the thing is that you can't have too many excursions and even if you do have an excursion, the parents have got to pay. And even if you do have an excursion it is awkward um there are four grade five classes and there are 45 in each class. That's the average number. Unfortunately I've got 43 but I had 44. So 44 or 45 times four, that's too large a number. Children don't learn anything. They're too noisy. They're outside it's different. You know. A lot of them don't go out with their parents. So when you do take them out there is no learning. No constructive learning that is taking place. You find that more and more with large numbers you're taking children to excursions to places where there is very little education value just because we want them to be exposed to these things even though they are not getting out what they should get out of it. That is happening.

R Do you see? You spoke of the dump here, and that you could take them there. Is

there another way that you can bring that aspect into the classroom? I am trying to think of things that will eliminate going out, but what one can do here. Is there specific equipment that one needs? Even if it is throw away resources and even if you ask students to bring them in. Do they do that or is it a problem?

T Yes it can be a problem because um you see the problem with asking students to bring things in, unfortunately you find that the community that we serve is used to getting things that's the truth. So it is difficult for them to give anything and if they are asked to give, maybe 5% or even less of the class will actually make a concerted effort. Where even with parents' involvement that will go and do the thing. Lots of them just won't do it. And so that causes the lesson to be a failure. So as a result you find that most of us when doing something in that way we will do it ourselves. We will bring it into our classrooms ourselves and the truth is the stresses that are being placed on the teachers is just too tremendous that you find that you are just trying to get through the syllabus. So there may be a time when this lends itself to this. You know if you really make an effort to bring the stuff in but if you are going to do it every single topic all the time.

R One may not be able to keep up with it.

T There are some things that you can bring into the classroom and it will make the learning experience richer. But there are some experiences that the child must be in that environment to see what the dump is really like. What does it smell like? How does it feel like when you are there? Things that are not tactile and so it will be difficult for the child to understand that. So um a lot of them – and yet at the same time I am convinced that environmental education is still important. A lot of our children – I mean we serve the majority of our children from previous really disadvantage groups. And yet we find that what happens is that when these children, when they throw a paper they really have no understanding of where it goes. They just think they. And they just hate picking up papers. They think it is demeaning if you tell them to pick up papers. I don't know but – but5 that is something they have to learn. They're in themselves, in their desks maybe it is clean and organised and neat, but when it comes to walking out on the playground, they don't think of everything cohesively. They think of everything in little groups, little pockets. So they have that problem.

R They don't have that global picture?

T Yes, that is it. Yes that's what they don't have. Yes they don't have that global

picture that this is going to affect me somewhere down the line. They just don't have that. They will be riding in a taxi or if you're taking them on an excursion and they'll bring packets of ... even though we've told them not to, and they'll just throw things out the window. And it is as if they have no idea that this is going somewhere. So.

R Now that message is an important one, that one wants to instil. Is it at all possible to work towards that in your formal curriculum?

T It is. It is In fact as a school, as a staff we are trying to put this into the children. Our litter problem is just getting worse and worse and worse every year. So we're trying to do that. Um I don't know how successful it has been. We haven't seen any results yet.

R But it is an ongoing thing that needs to be reinforced.

T Yes and then also the thing is that our children are of the mindset that looking after the environment, looking after animals. Looking after all that is things that you do if you have no time on your hands. That's what they think. They think that that is something you do when you know ...

R To keep you busy?

T Yes. They don't realise how important it is and how it affects them directly. They have no idea about that.

R As you know at this stage we don't have environmental education as a separate subject. So the only way we can get the message across is through the curriculum as we have it now. It is very structured. Possibly with outcomes based education that might change a bit. And I think sometimes teachers don't have the skills themselves to know what it is and they also tend to narrow the environment to just the natural and not think as you said the big picture. What I do affects others around you.

T You see what is happening is that um you have to speak about education when you talk about this because what is happening is that the teachers are being asked to do things that they are not skilled to do. We are um in a couple of years time in grade five we are going to do um OBE. And the truth is we don't have any skills for OBE. And a one day workshop, even two days, even a week of OBE is not going to do it because we've been at College for four, some even for five years and no one is properly trained how to do it a particular way. And now we've been told not to do it that way, but his way you know.

Transcription of the interview held with teacher 1 from school B.

For the purpose of the transcript, R refers to the questions posed by the researcher and T refers to the responses given by the teacher.

R Environmental education.

T What do you particularly mean by the environment?

R I think it would depend on your understanding of environmental education. When I'm using it I am really using it in its broadest sense. Not just referring to natural things like pollution for instance. I am looking at the social aspects, the economic aspect – all of it. So it's quite broad.

T How I see it – things that are happening in their world around them.

R Yes that's right. So if you look at it in terms of that, and looking at your senior classes (of teacher X), because I thought that it would be different how it is done. Because of your outcomes based approach. You are now into curriculum 2005 with certain terminology. You've got the three programmes and the environment would come into all of them but from your perspective would it mostly come into the life skills programme?

T Yes, we work under life skills, literacy and numeracy. Um, but when we're doing one of our phase organisers, you know you've got to cover certain phase organisers throughout the year, now we've found that um this year because of the school's birthday celebrations that took up so much time and there was so much disruption that we've decided that we're just going to make them shorter and more to what is happening at the time. And then it doesn't always – we can't always use those phase organisers because But we will make sure that even if we do more than five a year Because from now, from after the elections now we are going to start more on um on and health and much of this will now cover the comrades and healthy eating. Preparing for um comrades and fair play um and not always winning um that um so that will follow on then we might do pollution or you know conservation. Not necessary pollution where they could look to find an animal that's endangered and um - but it might be just be something that is mentioned on TV that will then follow up on something like that.

R So am I right in thinking that you are identifying a theme, broad theme and then from there you select various aspects. So if your taking the comrades and you're looking at healthy living etcetera and basically looking after yourself then you will be catering for their immediate environment – that aspect of life skills and environmental education comes in as well.

T But then we would also include literacy in that. You know if they were to read incidental words like um government that's covered in the literacy.

R So are you using your theme to bring in the three programmes – basically to integrate them?

T Mm, yes. So that even though environmental issues and Even the numeracy they learnt a lot by making their ID books because learning with the start of the date of birth. And now some of them know that they were born in '92 and some in '93. Um and that lead to quite a bit of discussion too. And learning the month of the year you cover so much. One thing leads to the next all the time.

R So if you plan towards um bringing in the phase organiser, now specifically the environment. What themes have you done?

T Environment?

R Yes.

T Um, we've done pollution.

R Do you take it as a broad theme?

T Yes a very broad theme, um that was when um we were asked for So we did pollution, mainly of water and comparing our water with that of shack dwellers and um and how the water gets polluted. How the water gets to the filter. We also did experiments. With a cleaning filter. Trying to use it like the blacks will do it with sand and stones. And then we also had some Geography teacher who got a special that is actually shows how they purify the water at the water works. And the ideal is that it would also cover water. The um we did, last year we did the sea and ocean and sea animals and we also did conservation and that was a lot on the crane. And we went to the bird park and um they learnt about the wetlands and where the cranes are protected and um. Now this year we just You know I find it hard to sort of say that we will do conservation but I also find and Mrs as well, that they sort of need us. Teaching must be relevant to them and topical at that time.

R In terms of the resources. Talking of all these themes, would you say that you depend

quite heavily on all kinds of resources? Your teaching being activity based. Are the things that you use expensive?

T No. We make do with what we've got. I think it depends on the teacher and how creative you are as to what you need. We could have gone off and gotten expensive things and what not but I just feel that and make use of whatever we've got. What I did do on pollution once um, I gave them each a packet to take home and within a certain hour, such as by five or six in the evening, they collected all the rubbish that would have been thrown away at that time and brought it to school the next day and we then discussed it and saw most was biodegradable and put them in to piles and um then from that we actually found that there was very little that needed to be thrown away. All of the others could have been used for something different. So um that they thoroughly enjoyed – doing that. And you know you only give one packet otherwise

R You'll get a truckload of rubbish!

I do realise as you say that it is very integrated. So in summarising then I would say that environmental education comes into your class if you do a phase organiser. You are not using the environment as a phase organiser – it still comes in incidentally.

T Yes.

R What about special days like water week.

T Yes we are working to have water week um, arbour day. But then we might not be involved in a theme on pollution, say at the time of arbour day, but then we will still incorporate arbour day.

R I was just thinking, your long term planning. Is that at all possible with this kind of curriculum? I know you mentioned that it is very difficult to plan because you need to be topical. Depending on what happens in the news comes in as well.

T No, no. We still have to do long term planning because there is still certain aspects that have got to be done you know. Reading, maths and the writing and all that. You've got that. Those skills come in.

R But if you think in terms of themes now?

T Oh yes. We still plan. Um like the themes would be like um two weeks plan. We used to make it longer, um but we found that their interests. Can't be too long. Um and now with so many topical things at the moment and that is why we are changing after two weeks.

R Now these topics that you plan every two weeks, do you plan for them a term in advance?

- T No, it would be every two weeks. We would now start planning for the next two weeks and then we sit with all the specific outcomes and we see which outcomes we specifically want to cover, um and which are applicable to what we do um within the next two weeks. And try to see that we don't do outcomes we have already done to try to cover – as long as we are satisfied that they are achieved.
- R The learners in the new curriculum, and I think even before that, you've been engaging in a lot of group work with them – or they were sitting in groups. In your experience did they work together in a group or does everybody do their own thing?
- T Um, they work very much for themselves. They will sit in a group, but the actual, um it is actually only from now on that a few are prepared to really share and work well in a group. I can now only see sort of leaders coming up. Because they had to give a little speech and then people would form up and they were actually amazed at the ones that came up to be the leaders – leaders of the group. Um, because there are quite a few here that are like Hitler himself and I thought they just terrorised the others. But they weren't elected. I did say to them. "Now think when you vote for that person, um does that person stick by what they promised, now?" And they will ask openly and say you don't always do as you say.

Transcription of the interview held with teacher 2 from school B

This transcription contains the responses of the teacher given in writing. For the purpose of this transcript, R refers to the questions posed by the researcher and T refers to the responses given by the teacher.

R What section of the syllabus did you cover?

T Plants used for food.

R What concepts did you plan to teach?

T Where plants store food. Use of different organs.

R What do you understand by environment and environmental education?

T Environment is our surroundings and environmental education is the awareness of factors that can enhance or destroy our environment.

R What particular aspect of the environment did you cover in this lesson?

T Plants we eat and growing vegetables.

R Why did you choose this aspect?

T It is part of the syllabus.

R Did the availability of resources play a role in your decision to include this aspect?

T No.

R Would you have rather done something else, but did not have the required resources?

T No.

R Does your scheme of work indicate where and when you include environmental issues in your lessons?

T Yes.

R How did you bring the environmental topic into the lesson?

T Through the actual planting of seeds.

R Do you feel confident when integrating environmental education into the main curriculum?

T Yes.

R Do you feel competent to integrate environmental education into the main curriculum?

T Yes.

Frequencies

Statistics

		SUBJECTS TAUGHT	NUMBER OF LEARNERS IN EACH GRADE	GRADES TAUGHT	SCHOOL TYPE	GENDER	NUMBER OF YEARS TEACHING	
N	Valid	13	13	13	13	13	13	13
	Missing	0	0	0	0	0	0	0

Statistics

		ACADEMIC QUALIFICATIONS	PROFESSIONAL QUALIFICATION S	INSTITUTION OBTAINED	MAJOR SUBJECTS
N	Valid	13	13	13	13
	Missing	0	0	0	0

Statistics

		YEAR OBTAINED	WHAT POSITION DO YOU HOLD?
N	Valid	13	13
	Missing	0	0

Frequency Table

SUBJECTS TAUGHT

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	GENERAL	9	69.2	69.2	69.2
	general science and english	1	7.7	7.7	76.9
	maths and language	1	7.7	7.7	84.6
	environmental studiesand others	1	7.7	7.7	92.3
	english, geography, PE	1	7.7	7.7	100.0
	Total	13	100.0	100.0	

NUMBER OF LEARNERS IN EACH GRADE

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20-30	3	23.1	23.1	23.1
	30-40	7	53.8	53.8	76.9
	40-50	3	23.1	23.1	100.0
	Total	13	100.0	100.0	

GRADES TAUGHT

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	GRADE 1	2	15.4	15.4	15.4
	GRADE 4	1	7.7	7.7	23.1
	GRADE 5	2	15.4	15.4	38.5
	GRADE 6	2	15.4	15.4	53.8
	GRADE 7	1	7.7	7.7	61.5
	GR 1 AND 4	1	7.7	7.7	69.2
	gr 4 6 7	1	7.7	7.7	76.9
	6 and 7	1	7.7	7.7	84.6
	gr 4 - 6	1	7.7	7.7	92.3
	gr 4 - 7	1	7.7	7.7	100.0
	Total	13	100.0	100.0	

SCHOOL TYPE

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	JUNIOR PRIMARY	1	7.7	7.7	7.7
	SENIOR PRIMARY	6	46.2	46.2	53.8
	BOTH JP AND SP	6	46.2	46.2	100.0
	Total	13	100.0	100.0	

GENDER

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	MALE	5	38.5	38.5	38.5
	FEMALE	8	61.5	61.5	100.0
	Total	13	100.0	100.0	

NUMBER OF YEARS TEACHING

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-5 YEARS	2	15.4	15.4	15.4
	6-10 YEARS	2	15.4	15.4	30.8
	10 OR MORE YEARS	9	69.2	69.2	100.0
	Total	13	100.0	100.0	

2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	unknown	11	84.6	84.6	84.6
	1983	1	7.7	7.7	92.3
	1986	1	7.7	7.7	100.0
	Total	13	100.0	100.0	

ACADEMIC QUALIFICATIONS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	MATRIC	11	84.6	84.6	84.6
	BA	1	7.7	7.7	92.3
	MEd	1	7.7	7.7	100.0
	Total	13	100.0	100.0	

PROFESSIONAL QUALIFICATION

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid STD	1	7.7	7.7	7.7
HDE	9	69.2	69.2	76.9
UNKNOWN	1	7.7	7.7	84.6
FDE	1	7.7	7.7	92.3
JS	1	7.7	7.7	100.0
Total	13	100.0	100.0	

INSTITUTION OBTAINED

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid COLLEGE	11	84.6	84.6	84.6
UNIVERSITY	2	15.4	15.4	100.0
Total	13	100.0	100.0	

MAJOR SUBJECTS

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid NONE	1	7.7	7.7	7.7
UNKNOWN	1	7.7	7.7	15.4
GENERAL	1	7.7	7.7	23.1
gen science maths history	1	7.7	7.7	30.8
media science and geography	1	7.7	7.7	38.5
maths and computers	2	15.4	15.4	53.8
english, history, drama	1	7.7	7.7	61.5
accounting and art	1	7.7	7.7	69.2
afrikaans, geography, science	1	7.7	7.7	76.9
maths	2	15.4	15.4	92.3
art and history	1	7.7	7.7	100.0
Total	13	100.0	100.0	

YEAR OBTAINED

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid UNKNOWN	2	15.4	15.4	15.4
1974	1	7.7	7.7	23.1
1982	1	7.7	7.7	30.8
1988	2	15.4	15.4	46.2
1990	2	15.4	15.4	61.5
1993	2	15.4	15.4	76.9
1996	3	23.1	23.1	100.0
Total	13	100.0	100.0	

WHAT POSITION DO YOU HOLD?

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid TEACHER	13	100.0	100.0	100.0

Frequencies

Statistics

		DO YOU USE THE WATER AUDIT	WATER QUALITY TEST	WASTE MANAGEMENT	ARBORDAY	ECOLOGY STUDIES	RECYCLING PROGRAMMES
N	Valid	13	13	13	13	13	13
	Missing	0	0	0	0	0	0

Statistics

		PROJECTS	MAGAZINES	NEWSPAPERS	FIELD TRIPS	PUPIL INVESTIGATIONS	ROLE PLAY
N	Valid	13	13	13	13	13	13
	Missing	0	0	0	0	0	0

Statistics

		POSTER MAKING	GUEST SPEAKERS	LECTURING	SHOWING VIDEOS	OTHER STRATEGIES
N	Valid	13	13	13	13	13
	Missing	0	0	0	0	0

Frequency Table

DO YOU USE THE WATER AUDIT

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ALWAYS	2	15.4	15.4	15.4
	OFTEN	4	30.8	30.8	46.2
	SOMETIMES	4	30.8	30.8	76.9
	SELDOM	2	15.4	15.4	92.3
	NEVER	1	7.7	7.7	100.0
	Total	13	100.0	100.0	

WATER QUALITY TEST

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ALWAYS	2	15.4	15.4	15.4
	OFTEN	1	7.7	7.7	23.1
	SOMETIMES	1	7.7	7.7	30.8
	SELDOM	3	23.1	23.1	53.8
	NEVER	5	38.5	38.5	92.3
	unknown	1	7.7	7.7	100.0
	Total	13	100.0	100.0	

WASTE MANAGEMENT

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ALWAYS	3	23.1	23.1	23.1
	OFTEN	6	46.2	46.2	69.2
	SOMETIMES	3	23.1	23.1	92.3
	UNKNOWN	1	7.7	7.7	100.0
	Total	13	100.0	100.0	

ARBORDAY

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ALWAYS	5	38.5	38.5	38.5
	OFTEN	5	38.5	38.5	76.9
	SOMETIMES	2	15.4	15.4	92.3
	NEVER	1	7.7	7.7	100.0
	Total	13	100.0	100.0	

ECOLOGY STUDIES

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ALWAYS	2	15.4	15.4	15.4
	OFTEN	4	30.8	30.8	46.2
	SOMETIMES	2	15.4	15.4	61.5
	SELDOM	3	23.1	23.1	84.6
	NEVER	1	7.7	7.7	92.3
	UNKNOWN	1	7.7	7.7	100.0
	Total	13	100.0	100.0	

RECYCLING PROGRAMMES

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ALWAYS	8	61.5	61.5	61.5
	OFTEN	3	23.1	23.1	84.6
	NEVER	2	15.4	15.4	100.0
	Total	13	100.0	100.0	

PROJECTS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ALWAYS	4	30.8	30.8	30.8
	OFTEN	3	23.1	23.1	53.8
	SOMETIMES	4	30.8	30.8	84.6
	SELDOM	1	7.7	7.7	92.3
	UNKNOWN	1	7.7	7.7	100.0
	Total	13	100.0	100.0	

MAGAZINES

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ALWAYS	7	53.8	53.8	53.8
	OFTEN	2	15.4	15.4	69.2
	SOMETIMES	2	15.4	15.4	84.6
	NEVER	2	15.4	15.4	100.0
	Total	13	100.0	100.0	

NEWSPAPERS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ALWAYS	5	38.5	38.5	38.5
	OFTEN	5	38.5	38.5	76.9
	SOMETIMES	2	15.4	15.4	92.3
	NEVER	1	7.7	7.7	100.0
	Total	13	100.0	100.0	

FIELD TRIPS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ALWAYS	3	23.1	23.1	23.1
	OFTEN	1	7.7	7.7	30.8
	SOMETIMES	6	46.2	46.2	76.9
	SELDOM	1	7.7	7.7	84.6
	NEVER	1	7.7	7.7	92.3
	UNKNOWN	1	7.7	7.7	100.0
	Total	13	100.0	100.0	

PUPIL INVESTIGATIONS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ALWAYS	4	30.8	30.8	30.8
	OFTEN	4	30.8	30.8	61.5
	SOMETIMES	4	30.8	30.8	92.3
	SELDOM	1	7.7	7.7	100.0
	Total	13	100.0	100.0	

ROLE PLAY

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ALWAYS	2	15.4	15.4	15.4
	OFTEN	5	38.5	38.5	53.8
	SOMETIMES	1	7.7	7.7	61.5
	SELDOM	2	15.4	15.4	76.9
	NEVER	2	15.4	15.4	92.3
	UNKNOWN	1	7.7	7.7	100.0
	Total	13	100.0	100.0	

POSTER MAKING

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ALWAYS	4	30.8	30.8	30.8
	OFTEN	5	38.5	38.5	69.2
	SOMETIMES	3	23.1	23.1	92.3
	SELDOM	1	7.7	7.7	100.0
	Total	13	100.0	100.0	

GUEST SPEAKERS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ALWAYS	2	15.4	15.4	15.4
	OFTEN	2	15.4	15.4	30.8
	SOMETIMES	3	23.1	23.1	53.8
	SELDOM	1	7.7	7.7	61.5
	NEVER	4	30.8	30.8	92.3
	UNKNOWN	1	7.7	7.7	100.0
	Total	13	100.0	100.0	

LECTURING

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	OFTEN	4	30.8	30.8	30.8
	SOMETIMES	1	7.7	7.7	38.5
	SELDOM	2	15.4	15.4	53.8
	NEVER	5	38.5	38.5	92.3
	UNKNOWN	1	7.7	7.7	100.0
	Total	13	100.0	100.0	

SHOWING VIDEOS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ALWAYS	1	7.7	7.7	7.7
	OFTEN	3	23.1	23.1	30.8
	SOMETIMES	3	23.1	23.1	53.8
	SELDOM	1	7.7	7.7	61.5
	NEVER	2	15.4	15.4	76.9
	UNKNOWN	3	23.1	23.1	100.0
	Total	13	100.0	100.0	

OTHER STRATEGIES

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	THEMES	1	7.7	7.7	7.7
	DEP	1	7.7	7.7	15.4
	NONE MENTIONED	11	84.6	84.6	100.0
	Total	13	100.0	100.0	

Frequencies

Statistics

		HOW ARE LEARNERS SEATED?	HOW OFTEN DO YOU PROVIDE AVTIVITY BASED LEARNING	HOW OFTEN CAN LEARNERS DEMONSTRATE WHAT THEY HAVE LEARNT?	HOW OFTEN DO YOU GET SUPPORT FROM EDUCATORS AT SCHOOL?	HOW OFTEN DO YOU GET SUPPORT FROM MANAGEMENT?	EE SHOULD ONLY BE TAUGH BY SCIENCE TEACHERS
N	Valid	13	13	13	13	13	13
	Missing	0	0	0	0	0	0

Statistics

		SHOULD BE TAUGHT BY TEACHERS WHO ARE INTERESTED	EE SHOULD NOT ONLY INFORM LEARNERS BUT LEAD TO ACTION	SHOULD BE TAUGHT ACROSS THE CURRICULUM	EE IS A CULTURAL SUBJECT	EE IS A WASTE OF TIME	SHOULD ONLY CREATE AWARENESS OF ENVIRONMENT
N	Valid	13	13	13	13	13	13
	Missing	0	0	0	0	0	0

Statistics

		SHOULD BE TAUGHT AS A SEPERATE SUBJECT	VAR00001
N	Valid	13	0
	Missing	0	13

Frequency Table

HOW ARE LEARNERS SEATED?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	GROUPS	6	46.2	46.2	46.2
	ROWS	7	53.8	53.8	100.0
	Total	13	100.0	100.0	

HOW OFTEN DO YOU PROVIDE AVTIVITY BASED LEARNING

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SOMETIMES	6	46.2	46.2	46.2
	MOST OF THE TIME	5	38.5	38.5	84.6
	ALL THE TIME	2	15.4	15.4	100.0
	Total	13	100.0	100.0	

DO NOT INTEGRATE EE INTO LESSONS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	OFTEN	1	7.7	8.3	8.3
	NEVER	4	30.8	33.3	41.7
	unknown	7	53.8	58.3	100.0
	Total	12	92.3	100.0	
Missing	System	1	7.7		
Total		13	100.0		

ARE YOU CONFIDENT TO INTEGRATE

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	13	100.0	100.0	100.0

HOW WOULD YOU RATE YOUR CONFIDENCE?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	V. HIGH	5	38.5	38.5	38.5
	HIGH	7	53.8	53.8	92.3
	UNCERTAIN	1	7.7	7.7	100.0
	Total	13	100.0	100.0	

ARE YOU COMPETENT TO TEACH EE

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	13	100.0	100.0	100.0

HOW WOULD YOU RATE YOUR COMPETENCE TO TEACH EE?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	V. HIGH	4	30.8	30.8	30.8
	HIGH	8	61.5	61.5	92.3
	UNCERTAIN	1	7.7	7.7	100.0
	Total	13	100.0	100.0	

DID YOU ATTEND THE WORKSHOP?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	11	84.6	84.6	84.6
	NO	2	15.4	15.4	100.0
	Total	13	100.0	100.0	

DID YOU FIND THE WORKSHOP USEFUL?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	V. USEFUL	5	38.5	38.5	38.5
	USEFUL	6	46.2	46.2	84.6
	unknown	2	15.4	15.4	100.0
	Total	13	100.0	100.0	

SHOULD BE TAUGHT ACROSS THE CURRICULUM

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	S. AGREE	7	53.8	53.8	53.8
	AGREE	5	38.5	38.5	92.3
	UNDECIDED	1	7.7	7.7	100.0
	Total	13	100.0	100.0	

EE IS A CULTURAL SUBJECT

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	S. AGREE	1	7.7	7.7	7.7
	AGREE	2	15.4	15.4	23.1
	UNDECIDED	3	23.1	23.1	46.2
	DISAGREE	5	38.5	38.5	84.6
	S. DISAGREE	2	15.4	15.4	100.0
	Total	13	100.0	100.0	

EE IS A WASTE OF TIME

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	DISAGREE	4	30.8	30.8	30.8
	S. DISAGREE	9	69.2	69.2	100.0
	Total	13	100.0	100.0	

SHOULD ONLY CREATE AWARENESS OF ENVIRONMENT

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	UNDECIDED	1	7.7	7.7	7.7
	DISAGREE	9	69.2	69.2	76.9
	S. DISAGREE	3	23.1	23.1	100.0
	Total	13	100.0	100.0	

SHOULD BE TAUGHT AS A SEPERATE SUBJECT

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	S. AGREE	2	15.4	15.4	15.4
	AGREE	3	23.1	23.1	38.5
	DISAGREE	4	30.8	30.8	69.2
	S. DISAGREE	4	30.8	30.8	100.0
	Total	13	100.0	100.0	

VAR00001

		Frequency	Percent
Missing	System	13	100.0

HOW OFTEN CAN LEARNERS DEMONSTRATE WHAT THEY HAVE LEARNT?

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid NOT AT ALL	1	7.7	7.7	7.7
SOMETIMES	3	23.1	23.1	30.8
MOST OF THE TIME	8	61.5	61.5	92.3
ALL THE TIME	1	7.7	7.7	100.0
Total	13	100.0	100.0	

HOW OFTEN DO YOU GET SUPPORT FROM EDUCATORS AT SCHOOL?

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid ALWAYS	5	38.5	38.5	38.5
OFTEN	2	15.4	15.4	53.8
SOMETIMES	4	30.8	30.8	84.6
NOT AT ALL	1	7.7	7.7	92.3
UNKNOWN	1	7.7	7.7	100.0
Total	13	100.0	100.0	

HOW OFTEN DO YOU GET SUPPORT FROM MANAGEMENT?

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid ALWAYS	6	46.2	46.2	46.2
OFTEN	2	15.4	15.4	61.5
SOMETIMES	3	23.1	23.1	84.6
SELDOM	1	7.7	7.7	92.3
UNKNOWN	1	7.7	7.7	100.0
Total	13	100.0	100.0	

EE SHOULD ONLY BE TAUGH BY SCIENCE TEACHERS

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid DISAGREE	7	53.8	53.8	53.8
S. DISAGREE	6	46.2	46.2	100.0
Total	13	100.0	100.0	

SHOULD BE TAUGHT BY TEACHERS WHO ARE INTERESTED

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid S. AGREE	1	7.7	7.7	7.7
AGREE	5	38.5	38.5	46.2
UNDECIDED	1	7.7	7.7	53.8
DISAGREE	3	23.1	23.1	76.9
S. DISAGREE	2	15.4	15.4	92.3
UNKNOWN	1	7.7	7.7	100.0
Total	13	100.0	100.0	

EE SHOULD NOT ONLY INFORM LEARNERS BUT LEAD TO ACTION

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid S. AGREE	10	76.9	76.9	76.9
AGREE	3	23.1	23.1	100.0
Total	13	100.0	100.0	

DO YOU REQUIRE MORE TRAINING

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	10	76.9	76.9	76.9
	NO	3	23.1	23.1	100.0
	Total	13	100.0	100.0	

Frequencies

Statistics

		WHAT POSITION DO YOU HOLD?	SCHOOL LIBRARY	CONDITION OF SCHOOL LIBRARY	SCHOOL LIBRARY	CONDITION OF SCHOOL LIBRARY	SCHOOL GROUND
N	Valid	13	13	13	13	11	13
	Missing	0	0	0	0	2	0

Statistics

		CONDITION OF SCHOOL GROUND	TELEPHONE	CONDITION OF TELEPHONE	FAX MACHINE	CONDITION OF FAX	TYPEWRITER
N	Valid	13	13	13	13	13	13
	Missing	0	0	0	0	0	0

Statistics

		CONDITION OF TYPEWRITER	PHOTOCOPIER	CONDITION OF PHOTOCOPIER	COMPUTER	CONDITION OF COMPUTER	INTERNET
N	Valid	13	13	13	13	9	13
	Missing	0	0	0	0	4	0

Statistics

		CONDITION OF INTERNET	FILM PROJECTOR	CONDITION OF FILM PROJECTOR	ELECTRICITY	CONDITION OF ELECTRICITY	PIPED WATER
N	Valid	2	13	5	13	13	13
	Missing	11	0	8	0	0	0

Statistics

		CONDITION OF WATER	SCIENCE WORK ROOM	CONDITION OF SCIENCE WORK ROOM	availability of text books	CONDITION OF TEXTBOOKS	AVAILIBIT Y OF EXERCISE BOOKS
N	Valid	13	13	1	13	12	13
	Missing	0	0	12	0	1	0

Statistics

		condition of exercise books	AVAILABILIT Y OF OHP	CONDITION OF OHP	AVAILABILITY OF AUDIOTAPES	CONDITION OF AUDIOTAPES	AUDIOTAPE PLAYER
N	Valid	13	13	10	13	9	13
	Missing	0	0	3	0	4	0

Statistics

		CONDITION OF AUDIOPLAYER	AVAILABILIT Y OF WALL CHARTS	CONDITION OF CHARTS	3	CONDITION OF TVVID	AVAILABILITY OF CHALKBOARD
N	Valid	9	13	13	12	10	13
	Missing	4	0	0	1	3	0

Statistics

		CONDITION OF CHALKBOARD	AVAILABILIT Y OF CHALK AND DUSTER	CONDITION OF CHALK AND DUSTER	AVAILABILIT Y OF EE POLICY	CONDITION OF EE POLICY	AVAILABILIT Y OF SCISSORS
N	Valid	13	13	13	13	7	13
	Missing	0	0	0	0	6	0

Statistics

		CONDITION OF SCISSORS	AVAILABILIT Y OF PAPER	CONDITION OF PAPER	AVAILABILIT Y OF CRAYONS	CONDITION OF CRAYONS	AVAILABILIT Y OF GLUE
N	Valid	10	13	11	13	9	13
	Missing	3	0	2	0	4	0

Statistics

		CONDITION OF GLUE	AVAILABILIT Y OF A TEACHERS CUPBOARD	CONDITION OF TEACHERS CUPBOARD	AVAILABILIT Y OF DESKS	CONDITION OF DESKS	AVAILABILIT Y OF CHAIRS
N	Valid	9	13	13	13	12	13
	Missing	4	0	0	0	1	0

Statistics

		YEAR OBTAINED	CONDITION OF CHAIRS	CONDITION OF LEARNERS WORK	AVAILABILIT Y OF LEARNERS WORK	cd player	condition of cd player
N	Valid	13	13	12	13	13	1
	Missing	0	0	1	0	0	12

Statistics

		magazines/newspapers/phamphlets	condition of magazines
N	Valid	13	1
	Missing	0	12

Frequency Table

WHAT POSITION DO YOU HOLD?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	TEACHER	13	100.0	100.0	100.0

SCHOOL LIBRARY

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	13	100.0	100.0	100.0

CONDITION OF SCHOOL LIBRAARY

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	VERY GOOD	5	38.5	38.5	38.5
	GOOD	4	30.8	30.8	69.2
	POOR	3	23.1	23.1	92.3
	VERY POOR	1	7.7	7.7	100.0
	Total	13	100.0	100.0	

SCHOOL LIBRARY

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	10	76.9	76.9	76.9
	NO	3	23.1	23.1	100.0
	Total	13	100.0	100.0	

CONDITION OF SCHOOL LIBRAARY

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	VERY GOOD	8	61.5	72.7	72.7
	GOOD	2	15.4	18.2	90.9
	POOR	1	7.7	9.1	100.0
	Total	11	84.6	100.0	
Missing	System	2	15.4		
Total		13	100.0		

SCHOOL GROUND

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	13	100.0	100.0	100.0

CONDITION OF SCHOOL GROUND

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	VERY GOOD	7	53.8	53.8	53.8
	GOOD	2	15.4	15.4	69.2
	POOR	3	23.1	23.1	92.3
	VERY POOR	1	7.7	7.7	100.0
	Total	13	100.0	100.0	

TELEPHONE

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	12	92.3	92.3	92.3
	UNKNOWN	1	7.7	7.7	100.0
	Total	13	100.0	100.0	

CONDITION OF TELEPHONE

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	VERY GOOD	7	53.8	53.8	53.8
	GOOD	4	30.8	30.8	84.6
	unknown	2	15.4	15.4	100.0
	Total	13	100.0	100.0	

FAX MACHINE

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	11	84.6	84.6	84.6
	UNKNOWN	2	15.4	15.4	100.0
	Total	13	100.0	100.0	

CONDITION OF FAX

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	VERY GOOD	7	53.8	53.8	53.8
	GOOD	3	23.1	23.1	76.9
	unknown	3	23.1	23.1	100.0
	Total	13	100.0	100.0	

TYPEWRITER

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid YES	12	92.3	92.3	92.3
unknown	1	7.7	7.7	100.0
Total	13	100.0	100.0	

CONDITION OF TYPEWRITER

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid VERY GOOD	8	61.5	61.5	61.5
GOOD	3	23.1	23.1	84.6
POOR	1	7.7	7.7	92.3
unknown	1	7.7	7.7	100.0
Total	13	100.0	100.0	

PHOTOCOPIER

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid YES	13	100.0	100.0	100.0

CONDITION OF PHOTOCOPIER

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid VERY GOOD	8	61.5	61.5	61.5
GOOD	3	23.1	23.1	84.6
unknown	2	15.4	15.4	100.0
Total	13	100.0	100.0	

COMPUTER

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid YES	10	76.9	76.9	76.9
NO	3	23.1	23.1	100.0
Total	13	100.0	100.0	

CONDITION OF COMPUTER

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid VERY GOOD	7	53.8	77.8	77.8
GOOD	1	7.7	11.1	88.9
unknown	1	7.7	11.1	100.0
Total	9	69.2	100.0	
Missing System	4	30.8		
Total	13	100.0		

INTERNET

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid YES	2	15.4	15.4	15.4
NO	10	76.9	76.9	92.3
unknown	1	7.7	7.7	100.0
Total	13	100.0	100.0	

CONDITION OF INTERNET

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	VERY GOOD	2	15.4	100.0	100.0
Missing	System	11	84.6		
Total		13	100.0		

FILM PROJECTOR

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	5	38.5	38.5	38.5
	NO	6	46.2	46.2	84.6
	unkonwn	2	15.4	15.4	100.0
Total		13	100.0	100.0	

CONDITION OF FILMPROJECTOR

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	VERY GOOD	5	38.5	100.0	100.0
Missing	System	8	61.5		
Total		13	100.0		

ELECTRICITY

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	13	100.0	100.0	100.0

CONDITION OF ELECTRICITY

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	VERY GOOD	9	69.2	69.2	69.2
	GOOD	3	23.1	23.1	92.3
	unknown	1	7.7	7.7	100.0
Total		13	100.0	100.0	

PIPED WATER

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	13	100.0	100.0	100.0

CONDITION OF WATER

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	VERY GOOD	8	61.5	61.5	61.5
	GOOD	3	23.1	23.1	84.6
	UNKNOWN	2	15.4	15.4	100.0
Total		13	100.0	100.0	

SCIENCE WORK ROOM

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	1	7.7	7.7	7.7
	unknown	12	92.3	92.3	100.0
	Total	13	100.0	100.0	

CONDITION OF SCIENCE WORK ROOM

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	VERY GOOD	1	7.7	100.0	100.0
Missing	System	12	92.3		
	Total	13	100.0		

availability of text books

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	12	92.3	92.3	92.3
	NO	1	7.7	7.7	100.0
	Total	13	100.0	100.0	

CONDITION OF TEXTBOOKS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	V. GOOD	5	38.5	41.7	41.7
	GOOD	3	23.1	25.0	66.7
	POOR	2	15.4	16.7	83.3
	V. POOR	2	15.4	16.7	100.0
	Total	12	92.3	100.0	
Missing	System	1	7.7		
	Total	13	100.0		

AVAILIBITY OF EXERCISE BOOKS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	13	100.0	100.0	100.0

condition of exercise books

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	V. GOOD	9	69.2	69.2	69.2
	GOOD	3	23.1	23.1	92.3
	UNKNOWN	1	7.7	7.7	100.0
	Total	13	100.0	100.0	

AVAILABILITY OF OHP

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	10	76.9	76.9	76.9
	NO	3	23.1	23.1	100.0
	Total	13	100.0	100.0	

CONDITION OF OHP

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	V. GOOD	7	53.8	70.0	70.0
	GOOD	3	23.1	30.0	100.0
	Total	10	76.9	100.0	
Missing	System	3	23.1		
Total		13	100.0		

AVAILABILITY OF AUDIOTAPES

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	9	69.2	69.2	69.2
	NO	2	15.4	15.4	84.6
	UNKNOWN	2	15.4	15.4	100.0
Total		13	100.0	100.0	

CONDITION OF AUDIOTAPES

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	V. GOOD	7	53.8	77.8	77.8
	GOOD	1	7.7	11.1	88.9
	POOR	1	7.7	11.1	100.0
	Total	9	69.2	100.0	
Missing	System	4	30.8		
Total		13	100.0		

AUDIOTAPE PLAYER

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	9	69.2	69.2	69.2
	NO	2	15.4	15.4	84.6
	UNKNOWN	2	15.4	15.4	100.0
Total		13	100.0	100.0	

CONDITION OF AUDIOPLAYER

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	V. GOOD	7	53.8	77.8	77.8
	POOR	2	15.4	22.2	100.0
	Total	9	69.2	100.0	
Missing	System	4	30.8		
Total		13	100.0		

AVAILABILITY OF WALL CHARTS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	13	100.0	100.0	100.0

CONDITION OF CHARTS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	V. GOOD	7	53.8	53.8	53.8
	GOOD	4	30.8	30.8	84.6
	POOR	1	7.7	7.7	92.3
	UNKNOWN	1	7.7	7.7	100.0
	Total	13	100.0	100.0	

3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	8	61.5	66.7	66.7
	NO	2	15.4	16.7	83.3
	UNKNOWN	2	15.4	16.7	100.0
	Total	12	92.3	100.0	
Missing	System	1	7.7		
Total		13	100.0		

CONDITION OF TVVID

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	V. GOOD	7	53.8	70.0	70.0
	GOOD	2	15.4	20.0	90.0
	V. POOR	1	7.7	10.0	100.0
	Total	10	76.9	100.0	
Missing	System	3	23.1		
Total		13	100.0		

AVAILABILITY OF CHALKBOARD

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	13	100.0	100.0	100.0

CONDITION OF CHALKBOARD

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	V. GOOD	9	69.2	69.2	69.2
	GOOD	2	15.4	15.4	84.6
	POOR	1	7.7	7.7	92.3
	UNKNOWN	1	7.7	7.7	100.0
	Total	13	100.0	100.0	

AVAILABILITY OF CHALK AND DUSTER

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	13	100.0	100.0	100.0

CONDITION OF CHALK AND DUSTER

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	V. GOOD	9	69.2	69.2	69.2
	GOOD	2	15.4	15.4	84.6
	POOR	1	7.7	7.7	92.3
	UNKNOWN	1	7.7	7.7	100.0
	Total	13	100.0	100.0	

AVAILABILITY OF EE POLICY

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	6	46.2	46.2	46.2
	NO	7	53.8	53.8	100.0
	Total	13	100.0	100.0	

CONDITION OF EE POLICY

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	V. GOOD	4	30.8	57.1	57.1
	POOR	2	15.4	28.6	85.7
	V. POOR	1	7.7	14.3	100.0
	Total	7	53.8	100.0	
Missing	System	6	46.2		
Total		13	100.0		

AVAILABILITY OF SCISSORS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	9	69.2	69.2	69.2
	NO	3	23.1	23.1	92.3
	UNKNOWN	1	7.7	7.7	100.0
	Total	13	100.0	100.0	

CONDITION OF SCISSORS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	V. GOOD	7	53.8	70.0	70.0
	GOOD	2	15.4	20.0	90.0
	V. POOR	1	7.7	10.0	100.0
	Total	10	76.9	100.0	
Missing	System	3	23.1		
Total		13	100.0		

AVAILABILITY OF PAPER

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	11	84.6	84.6	84.6
	NO	1	7.7	7.7	92.3
	UNKNOWN	1	7.7	7.7	100.0
	Total	13	100.0	100.0	

CONDITION OF PAPER

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	V. GOOD	8	61.5	72.7	72.7
	GOOD	2	15.4	18.2	90.9
	UNKNOWN	1	7.7	9.1	100.0
	Total	11	84.6	100.0	
Missing	System	2	15.4		
Total		13	100.0		

AVAILABILITY OF CRAYONS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	10	76.9	76.9	76.9
	NO	2	15.4	15.4	92.3
	UNKNOWN	1	7.7	7.7	100.0
	Total	13	100.0	100.0	

CONDITION OF CRAYONS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	V. GOOD	7	53.8	77.8	77.8
	GOOD	2	15.4	22.2	100.0
	Total	9	69.2	100.0	
Missing	System	4	30.8		
Total		13	100.0		

AVAILABILITY OF GLUE

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	9	69.2	69.2	69.2
	NO	3	23.1	23.1	92.3
	3.00	1	7.7	7.7	100.0
	Total	13	100.0	100.0	

CONDITION OF GLUE

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	V. GOOD	7	53.8	77.8	77.8
	GOOD	2	15.4	22.2	100.0
	Total	9	69.2	100.0	
Missing	System	4	30.8		
Total		13	100.0		

AVAILABILITY OF A TEACHERS CUPBOARD

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	13	100.0	100.0	100.0

CONDITION OF TEACHERS CUPBOARD

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	V. GOOD	9	69.2	69.2	69.2
	GOOD	1	7.7	7.7	76.9
	POOR	2	15.4	15.4	92.3
	V. POOR	1	7.7	7.7	100.0
	Total	13	100.0	100.0	

AVAILABILITY OF DESKS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	10	76.9	76.9	76.9
	NO	3	23.1	23.1	100.0
	Total	13	100.0	100.0	

CONDITION OF DESKS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	V. GOOD	7	53.8	58.3	58.3
	GOOD	2	15.4	16.7	75.0
	POOR	2	15.4	16.7	91.7
	V. POOR	1	7.7	8.3	100.0
	Total	12	92.3	100.0	
Missing	System	1	7.7		
Total		13	100.0		

AVAILABILITY OF CHAIRS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	12	92.3	92.3	92.3
	NO	1	7.7	7.7	100.0
	Total	13	100.0	100.0	

YEAR OBTAINED

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	UNKNOWN	2	15.4	15.4	15.4
	1974	1	7.7	7.7	23.1
	1982	1	7.7	7.7	30.8
	1988	2	15.4	15.4	46.2
	1990	2	15.4	15.4	61.5
	1993	2	15.4	15.4	76.9
	1996	3	23.1	23.1	100.0
	Total	13	100.0	100.0	

CONDITION OF CHAIRS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	V. GOOD	7	53.8	53.8	53.8
	GOOD	2	15.4	15.4	69.2
	POOR	3	23.1	23.1	92.3
	UNKNOWN	1	7.7	7.7	100.0
	Total	13	100.0	100.0	

CONDITION OF LEARNERS WORK

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	V. GOOD	7	53.8	58.3	58.3
	GOOD	2	15.4	16.7	75.0
	POOR	2	15.4	16.7	91.7
	UNKNOWN	1	7.7	8.3	100.0
	Total	12	92.3	100.0	
Missing	System	1	7.7		
Total		13	100.0		

AVAILABILITY OF LEARNERS WORK

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	10	76.9	76.9	76.9
	NO	3	23.1	23.1	100.0
	Total	13	100.0	100.0	

cd player

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	1	7.7	7.7	7.7
	unknown	12	92.3	92.3	100.0
	Total	13	100.0	100.0	

condition of cd player

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	v. good	1	7.7	100.0	100.0
Missing	System	12	92.3		
Total		13	100.0		

magazines/newspapers/phamphlets

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	1	7.7	7.7	7.7
	unknown	12	92.3	92.3	100.0
	Total	13	100.0	100.0	

condition of magazines

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	good	1	7.7	100.0	100.0
Missing	System	12	92.3		
Total		13	100.0		