WORLD HERITAGE SITES AS ENVIRONMENTAL EDUCATION RESOURCES: A CASE STUDY OF THE CRADLE OF HUMANKIND

by

MATLALA VIOLET MAKOKOTLELA

Submitted in part fulfillment of the requirements for the degree of

MASTER OF EDUCATION-WITH SPECIALISATION IN ENVIRONMENTAL EDUCATION

at the

UNIVERSITY OF SOUTH AFRICA

Supervisor: Prof CP Loubser

12 OCTOBER 2009

I declare that "*World heritage sites as environmental education resources: a case study of the Cradle of Humankind"* is my own work and that all the sources that I have used and or quoted have been indicated and acknowledged by means of complete references.

SIGNED….....

Matlala Violet Makokotlela

DATE: …….

ACKNOWLEDGEMENTS

I would like to thank those who contributed towards my research because without their assistance it would have been difficult, if not impossible to fulfil the requirements for Masters Degree in this field:

- The Almighty God for the wisdom, strength and perseverance to complete this dissertation.
- My parents, Makhoshi and Mmankwana Makokotlela, my brother Ngwako Makokotlela for having laid the foundation of love for reading.
- My son, Khotso and his wife Boitumelo Makokotlela for provision of a computer, printer, assisting with computer skills and the sacrifice of their time.
- My sister's daughter, Moyahabo Matsaka, for typing my work in a time of need, assisting with computer skills when my son was not available and her indefatigable support.
- My promoter, Prof. C P Loubser for showing confidence in me, his support, encouragement, and guidance.
- Unisa for affording me the opportunity to prove myself.
- The Maropeng staff for sacrificing their time and allowing me to conduct the interviews.
- The Tshwane South District teachers who sacrificed their time to answer questionnaires and interacting with me during interviews.
- My mentor, Mrs Carol Jansen for having mentored me in the manner she did.

ABSTRACT

Studies have shown that world heritage sites are regarded as environmental education (EE) resources. However, environmental activities are not integrated with the National Curriculum Statement (NCS) because the heritage educator and guides are not trained in EE, the heritage educator do not liaise with the Department of Education (DoE) especially the curriculum implementation unit and World Heritage Youth Forum.

The purpose of this study is to establish the role that world heritage sites can play to provide adequate access to appropriate EE resources since this is a problem that hampers successful implementation of EE. The study gathered data through observation, document analysis, interviews and questionnaire. The data analysis was based on an inductive process that builds concepts.

The study recommends training of heritage educator and guide in EE, heritage educator to liaise with Department of Education especially the curriculum implementation unit and the World Heritage Youth Forum to ensure effective implementation of environmental activities at the site.

Key concepts

Heritage, Site, Heritage sites, World heritage sites, Environment, Education, Environmental Education, Environmental Education resources.

Tab of contents

Chapter 2: **Conceptualization and Contextualization of World Heritage sites as environmental education resources**

CHAPTER 1

ORIENTATION

1.1 Introduction

The Federal Register (1992) *in* Clacherty (1995: ii) states that environmental education (EE) seeks to develop the necessary knowledge, understanding, values, skills and commitment to allow people to be proactive in securing a healthy and properly functioning environment that is sustainable (it will still be good for future generations). This is as true for people's local environments as it is for regional and global environments. EE should enable people to understand and interact with their environment in such a manner that the future generations will also benefit from the same environment, starting from local right through to national and global contexts.

EE should take place at both formal and non-formal levels. Formal and non-formal education is seen to be indispensable to changing people's attitudes (Sitarz 1994: 93). In addition, private organisations can make an important contribution to designing and implementing educational programmes (Sitarz 1994: 94). Corsane (2005: 215) is of the opinion that heritage resources have the potential of being vital and dynamic educational assets.

Smith (2001) *in* Simelane (2006: 14) defines non-formal education as:

'Any organized education activity outside the established formal system – whether operating separately or as an important feature of some broader activity that is intended to serve identifiable learning clienteles and learning objectives'.

For the purpose of this study non-formal education is any education that takes place in work places, at botanical gardens, heritage sites, museums, or in any other place outside a formal school set-up offered to people of all ages. The Cradle of Humankind that was proclaimed a heritage site in 1999 (Maropeng 2006: under World Heritage Site; Rainbird, s.a map; Sindane 2003: 1) offers educational activities for visiting educators and learners from schools. It is important to note that heritage sites are regarded as EE resources by the Department of Education (DoE) and some scholars as will be shown below. The question now is: What role can heritage sites play to provide adequate access to appropriate EE resources? As indicated above, private organisations such as heritage sites can make a great contribution to implementing educational

programmes and can therefore contribute positively to education if they implement EE successfully.

1.2 Heritage sites as EE resources

Heritage sites are regarded as EE resources by a number of authors (Corsane 2005: 215; Places 1997-2005: 2; Robben Island Museum Annual Report 2002-2003: 1; Mackeicher & Du Cross 2002: 7; Orbasli 2000: 2). According to Corsane (2005: 215) heritage resources have the potential of being vital and dynamic educational assets. For example, the Robben Island Museum Annual Report (2002-2003:1) has this to say: "We started education on the island museum with empty cement bag paper, we used cement bag papers to make books." An activity involving making books from cement bag papers is in itself part of EE because it involves recycling. Mackeicher and Du Cross (2002: 7) states that heritage sites should be conserved, protected or preserved since they provide some essential educational, historical and economic information. It is imperative to indicate that, when the concept "education" is mentioned in the National Curriculum Statement (NCS), EE is also implied since it is not a formal subject, but seen as a theme that needs to be incorporated into the mainstream of education. To support the approach with EE, just mentioned, Maropeng, the exhibition centre of the Cradle of Humankind, has developed a sustainability wall on which a number of environmental issues are covered (Maropeng 2006: under sustainability).

Abrahams and Corsane (2000: 16) mention that some South African museums and heritage institutions, organisations or agencies have been fighting for survival by claiming that they are valuable educational resources. The authors add that according to the model for empowering heritage educators, some key objectives require heritage educators to help learners at all levels to become aware of the diverse natural heritage resources around them, and what can be learned from studying those resources.

1.3 Reflection on the incorporation of environmental education at different levels:

1.3.1 International level

Heritage sites as EE resources became an issue after general agreements were reached at International conferences such as the Tbilisi, Stockholm and Moscow conferences; reports (Brundtland Report); charters (Belgrade charter) as in Palmer and Neal (1994: 23), as well as

summits (The Earth Summit: agenda 21, and World Summit on Sustainable Development), results stating that EE should be implemented in work environments, and in education at both formal and non-formal level Sitarz (1994: 93). It was, furthermore, agreed that EE is a vehicle that can be used to address environmental issues and challenges as indicated in Bornman (1977:3) the World Conservation Strategy (Palmer & Neal 1994: 23).

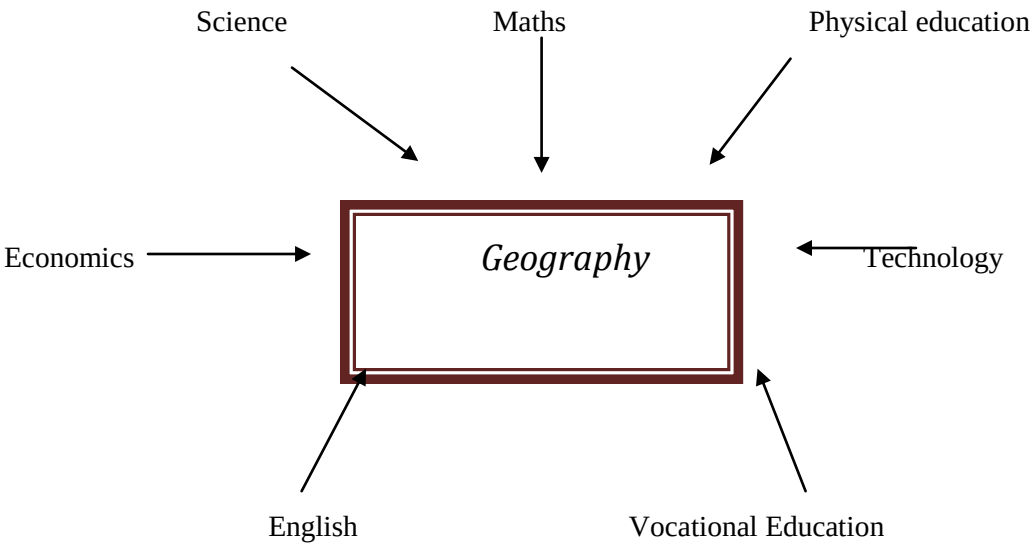
1.3.2 National level

Consideration has also been given to the incorporation and promotion of EE in work environments and in schools at national level in various South African official documents and policies that promulgate the incorporation of EE even at national level. These include, amongst others, the Norms and Standards (2000) formally known as the COTEP document on Teacher Education and Training (1995); the Constitution of the Republic of South Africa (1996); The Green Paper: An Environmental Policy for South Africa (1996); Department of Education (1995), Brunto (2003); Department of Environmental Affairs and Tourism (1998). Resources such as books, maps, magazines and places (environmental education centres and heritage sites) that provide relevant information are essential for the successful implementation of EE. According to Wagiet (2002:30) inadequate access to appropriate learning support materials (LSM) presents serious problems. At the moment obtaining learner teacher support material (LTSM) for teaching in general is problematic, the same applies for EE. If heritage educators could be trained in both the NCS and EE they could provide EE successfully to teachers and learners. EE is interdisciplinary and should use a cross-curricular approach (Tbilisi 1977 :15; Loubser 1997: 26). The interdisciplinary character of EE means that EE should form part of every discipline at tertiary level, and also form part of the content of each subject/ learning area in schools (Tbilisi, 1977: 15; Unesco, 1985: 8). According to the Tbilisi declaration's guiding principles (1977: 15, EE should be interdisciplinary in its approach, drawing on the specific contents of each discipline in making possible a holistic and balanced perspective.

Diagram 1.1 shows that when a discipline, for example geography, is being taught, some information can be drawn from other disciplines, as the arrows indicate. This reinforces the aforementioned, namely that when EE is taught in schools information will also be drawn from other subjects or learning areas, which points to the fact that EE is not merely an independent curriculum or subject, but a theme to be incorporated into the main curriculum. EE is taught in

subjects and learning areas through learning outcomes and assessment standards address environmental issues.

Diagram 1.1 **An interdisciplinary approach**



Loubser (1997: 26).

"*Environmental education should not be just one more subject to add to existing programmes, but should be incorporated into programmes intended for all learners, whatever their age… Its subject-matter should permeate every aspect of formal and non-formal programmes and constitute one and the same continuous, organic process… The central idea is to attain, by means of growing interdisciplinary and of prior co-ordination of disciplines, a practical education oriented towards a solution of the problems of the environment, or at least to make pupils better equipped… to participate in decision making' (Unesco-UNEP, 1987 :10),source (Final Report, Tbilisi conference 1972: 20).*"

Interdisciplinary teaching according to Unesco (1985: 8) refers to teaching where two or more disciplines are integrated because of their interrelationships, while cross-curricular teaching can mean many things. In teaching to a common theme in Design and Technology, a mathematics teacher can help students with the use of language and cross-curricular weeks can be organised during the summer term where projects in the local community can be carried out (Loubser 1997: 25). A further explanation is that cross-curricular dimensions are those distinctive concerns that unite a number of curriculum areas and different fields of knowledge.

A cross-curricular teaching approach for the purpose of this study is an approach in which EE is incorporated in the curriculum and taught at all levels, phases and grades in all subjects and learning areas. Indications are that EE is an approach to education as a whole, rather than being regarded as a subject as mentioned before (Tbilisi declaration 1977: 21). It is important, therefore, to reiterate that EE is neither a curriculum nor a subject, but a theme to be incorporated into the main curriculum.

1.4 Problem description

According to Wagiet (2002: 30) inadequate access to appropriate learner teacher support materials (LTSM) is a widespread problem, and the same problem applies to EE. Successful implementation of EE depends on adequate access to appropriate LTSM by both educators and learners. The author further states that inadequate access to appropriate LTSM is in general problematic. A report of the review committee on the implementation of curriculum 2005, released on 31 May 2000, identifies the lack of LTSM as one of the hindering factors for successful implementation of this curriculum (Department of Education, 2002; under reasons for revision of C2005). Bopape (2006: 102) mentions that the effectiveness of teaching in classrooms is influenced by the teacher's ability to find, use and develop teaching methods and resources that are appropriate for EE. This viewpoint is held by Maila (2003: 38), who says schools face various problems concerning the use of LTSM, the most common ones being availability, quality, and use of LTMS. It is also pointed out that teachers lack time, resources and often skills to develop their own resources. Mudzunga (2006: 121) states that teachers should be involved in resource development at the Schoemansdal EE centre. The author explains that if teachers are involved in the process of developing EE resources they will understand, be able to use, and develop resources themselves, and therefore be able to implement EE successfully.

The provision of sufficient and appropriate LTSM to both educators and learners is essential for the effective implementation of EE. The shortage of EE resources has proven to be a serious issue in South Africa and in the world. The indications are that the large-scale development and dissemination of educational materials has been an issue that has demanded further research in Southern Africa and elsewhere in the world (Taylor & Russo 2002: 39). The lack of sufficient and appropriate EE resources is a problem that is experienced throughout the world and is indeed an issue that needs further research.

In the South African education system, the NCS incorporate EE in terms of critical and developmental outcomes, NCS principles, learning outcomes and assessment standards that address environmental issues and this is seen as an important development (Department of Education 2002: 5&10). Teachers need to be supplied with LTSM that would enable them to teach learner activities that address environmental issues, and therefore implement EE more successfully.

Learners should acquire knowledge and skills that will enable them to identify environmental issues and provide them with the necessary skills to find solutions for the issues. Unfortunately, the lack of adequate access to appropriate EE resources will prevent educators from implementing EE successfully. If heritage sites offered programmes and activities that address the learning outcomes and assessment standards focusing on environmental issues, this would alert educators to the fact that outdoor EE activities differs from a mere school outing. It should be clear to educators that with outdoor EE activities learners must learn and not just participate in a tour. This statement provides evidence of the fact that educators need EE resources that will enable them to teach learners confidently and effectively.

Frohlich (2004: 88) states that unavailability of a set of complete course materials was a challenge to the tutors in a semi-distance EE course in Namibia. The tutors indicate that the late arrival of material has affected the tutoring process negatively. This shows that the availability of resources can play a positive role in as far as the effective implementation of EE is concerned. Heritage educators should therefore be in a position to help educators by providing programmes and activities from which learners can learn while visiting heritage sites. Palmer and Neal (1994: 173) have this to say about heritage sites as EE resources:

"*English heritage provides a full range of information and teaching and learning resources for their 350 plus sites. As with the other countries of the UK the aim is to provide teachers with as much help as possible to make use of the historic environments"*.

Therefore, it is imperative that teachers are provided with help in terms of resources for the successful implementation of EE. According to Corsane (2005: 215), heritage resources have the potential of being vital and dynamic educational assets, while Abrahams and Corsane (2000: 16) indicate that now is the time for heritage educators to act as the new system of education is being

implemented. Heritage educators should really take advantage of the fact that the NCS provides opportunities for incorporating environmental education in teaching and learning.

1.4.1. Problem statement

From the above-mentioned problem description a problem statement is formulated in the form of a main question and sub-questions. The main reason is because questions serve as boundaries around the study without unduly constraining it (Marshall and Rossman 2006: 40), while Locke, Spirdus and Silverman in Kobola (2007: 16) agree by saying questions are the tools commonly employed to provide a focus for thesis and dissertation studies. According to Gray (2004: 187) questions are research tools through which people are asked to respond to the same set of questions in a predetermined order. Andrews in Kobola (2007: 16) mention that the research questions must have the potential for being answered in the project to be undertaken. This means questions are inquisitive in the sense that they warrant answers. The main question and sub-questions of this study are formulated as follows:

The main question:

What role can world heritage sites play to provide adequate access to appropriate EE resources?

Sub-questions

- **What kind of training can be provided to the heritage educational staff to enable them to implement EE effectively?**
- **What kind of training can be provided to the tour guides to enable them to implement EE effectively?**
- **What kind of EE programmes and learners activities should heritage sites provide to teachers and learners?**
- **How can EE resources at the heritage site assist teachers to implement EE successfully?**

1.4.2. Hypothesis

A hypothesis is an expected result (Thomas & Nelson 1990: 13). The authors further indicate that when a person sets out to conduct a study, he or she generally has an idea of what the outcome will be. A hypothesis is an expected answer provided by the researcher during the initial stage of the research. Based on this explanation, a hypothesis is formulated for this study.

World heritage sites will be successful with EE programmes and learners activities if:

1. The educational staff of the site is work-shopped or trained in both the National Curriculum Statement and EE.
2. Learner's activities at the sites are directed at achieving the outcomes and assessment standards addressing environmental issues.
3. The educational staff of heritage sites liaises with the Department of Education.

1.5. Research question

Based on the above-mentioned problem and hypothesis statements the following questions can be asked with reference to the Cradle of Humankind heritage site's EE programmes.

1. How effective are the EE programmes presented by this site?
2. Are these programmes directed at achieving the environmental outcomes and assessment standards as set out in the National Curriculum Statement?
3. Has the educational staff of the site received adequate training to address the prescribed environmental outcomes and assessment standards focusing on environmental issues?

1.6. Purpose of the study

Reference has already been made to the fact that EE materials have been an issue that demands further research in South Africa and elsewhere in the world (Taylor & Russo 2002: 39). Despite the fact that attempts have been made in terms of developing materials for environmental education and the fact that identification of places that can provide EE information has been done (Taylor & Russo 2002: 37; President's Report 1996: 32; Palmer & Neal 1994: 173), it is essential at this point in time to assess the accessibility, appropriateness and effectiveness of these

resources. According to Taylor and Russo (2002: 39) over 200 different educational resource materials have been developed and published in response to the local needs and context. The English heritage provides a full range of information and teaching and learning resources for their 350 and more sites (Palmer & Neal 1994: 173). As mentioned before, it is imperative to clarify the role that heritage sites can play to provide adequate access to appropriate EE since they are regarded as EE resources.

LTSM is important and needs to receive attention if the successful implementation of EE is to be ensured. Wagiet (2002: 30) indicates that inadequate access to appropriate LTSM is in general problematic, and that the same applies to LTSM for EE. This confirms what has been mentioned before, namely that educators experience problems with regard to accessing appropriate LTSM. The provision of appropriate LTSM and knowledge of where to find the material is essential for both educators and learners for the successful implementation of EE. Therefore, the aim of this study is to explore how heritage educators develop EE programmes and activities addressing environmental issues.

1.7. Motivation for the research

South Africa is characterised by a number of policies that promote the implementation of EE through formal and non-formal education. These policies include: the constitution of the Republic of South Africa (1996); the White paper on Education and Training (1995); the Norms and Standards for Educators policy (2000); Brunton et al 2003; Department of Education (2003); and the National Environmental Management Act (1998), to name only a few.

The Constitution of the Republic of South Africa (1996: 11) provides a basis for the incorporation of EE in the curriculum. It states that:

"Every one has the right –

to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that-

(i) prevent pollution and ecological degradation;

(ii) promote conservation, and

(iii) *secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development*."

EE should teach learners to use resources in such a manner that the future generations will also benefit from these resources that include amongst others, soil, fresh air and water. Learners should be taught about conservation of the environment and should be made aware of what sustainable ecological, economic, and social development means. They should also be taught about the manifesto on values, education, and democracy which advocates ethics in the environment, while considering that the constitution links environmental issues to values underpinned by human rights and social responsibilities, and it is pointed out that for this to be realised, EE is crucial. In addition, they should take cognisance of the fact that the constitution links environmental issues to values underpinned by human rights and social responsibilities, and point out that for this to be realised, EE is crucial, taking into account the right to an environment that is not detrimental to the citizen's health or well-being (Department of Education 2001: 74).

South Africa's curriculum, the NCS, is characterised by the critical and developmental outcomes that are derived from the constitution, as well as the principles, learning outcomes, and assessment standards addressing environmental issues (Department of Education 2002: Subjects and Learning Area Policy Documents). The following developmental outcome requires learners to be able to participate in the life of local, national and global communities and it reads:

*"Participate as responsible citizens in the life of local, national and global communities" (*Department of Education 2003: 2)

Learners should, therefore, be empowered with the knowledge and skills that enable them to identify and solve environmental problems in their environments as well as being able to identify and solve problems at national and global levels.

Global warming is considered to be the result of the human impact on the environment. Environmentally literate citizens would assist in the reduction of the negative impact on the environment. All these design features provide opportunities for the incorporation of EE in the curriculum. Some of the learning outcomes and assessment standards focus on heritage issues where learners should be taught the conservation of resources and heritage sites. South Africa's curriculum is underpinned by the NCS principles and one of those promotes the incorporation of EE in the mainstream. All phases which include the foundation, intermediate, senior, FET-general phases as well as all the grades (grades R-12), should comply with this principle: A healthy environment, social justice, human rights and inclusivity (Department of Education 2002: 10).

This research can benefit the country since heritage sites would provide EE programmes and activities that address environmental issues based on recommendations made by this research. Consequently, educators who visit the site can be empowered to implement EE in schools with confidence. A further result will be that the envisaged goal is achieved of developing citizens who are environmentally literate (The White Paper on Education & Training 1995: 22). The result will be environmentally literate citizens who act responsibly towards the environment and, therefore, reduce their negative impact on the environment.

EE can become viable and its goals can be realised by communities that receive it. Consequently, it can enable people to address local environmental issues, by identifying and trying to solve environmental problems at local, national and global levels.

The expected results of this research are:

- The educational staff of heritage sites will receive training and opportunities to attend workshops on both the NCS and EE.
- Heritage sites will offer EE programmes and activities that address environmental issues.

1.8 Research approach, method and design

Qualitative research is oriented towards concrete cases in their temporal and local particularity and starting from people's expressions and activities in their local contexts (Flick 2006: 30). This approach studies social phenomena with various genres including interpretive and uses multiple methods of inquiry (Marshall and Rossman 2006: 2). Case studies are seen as prime examples of qualitative research that adopt an interpretive approach to data, study "things" within their context and consider the subjective meanings that people bring to their situations (De Vaus 2001: 10).

According to Mouton (2001: 194), in qualitative research, the researcher attempts to understand people in terms of their own definition of the world in which they live. In most cases it describes and analyses people's individual and collective beliefs, thoughts, social actions and perceptions. The qualitative approach is employed in order to understand the role of heritage sites as EE

resources, that is, how officials at the Cradle of Humankind (local context) utilise this site as an EE resource.

Yin in De Vaus (2001: 8) mentions that research design deals with a logical problem and not a logistical problem, whereby issues such as sampling, methods of data collection (questionnaires, observation, document analysis), design of questions are all subsidiary to the point of 'What evidence does one need to collect?' Mouton (2001: 185) says that in experiments and surveys, the elements of the research design such as hypothesis formulation and measurement, are specified prior to data collection, while design elements in qualitative research are usually worked out during the course of the study.

In addition, Mouton (2001: 49) mentions possible challenges or limitations of the research process that should be taken into consideration. In that respect, the study may experience a challenge in terms of lack of access to some of the sites since the Cradle of Humankind has fifteen sites that make up the World Heritage Site, some of which are privately owned.

1.8.1 Data collection methods, analysis and interpretation

Merriam (2001) in Simelane (2006: 7) says data is what the researcher considers as useful information for his or her research purposes. According to Mouton (2001: 99), data sources can be classified into various categories for example, observation and interviews. The following methods were employed to collect data: observation, documentation, conducting interviews, and questionnaires.

(a) Observation

It includes participant observation in natural field settings as (Mouton 2001: 99) explains. An observation was done and this method is chosen so that the researcher can have personal experience of what is taking place regarding EE at the Cradle of Humankind World Heritage Site. Observations were done when the educational staff of the site offered lessons and activities to teachers and learners who visited the site.

(b) Document analysis

Various types of documents can be used such as written, oral, photographs, cultural artefacts, public records, personal documents, and physical materials (Merriam 2002: 13). According to Gray (2004: 320), qualitative research can use results from document analysis. This study used document analysis as a data collection method to analyse a document such as Maropeng's teacher resource pack, Maropeng's educational resource pack (written), telephones, and the sustainability wall (which this study regards as also physical, and oral (interviews) .

(c) Interviews

Qualitative interviewing is intended to refer to in-depth, semi-structured or loosely structured forms of interviewing (Mason 2002: 62). The author further indicates that qualitative interviews may involve one-to-one interactions, larger group interviews or focus groups, and may take place face-to-face, over the telephone or via the internet.

(d) Focus group interviews

It refers to the style of interview that is designed for small groups (Berg 1998: 100). The focus group in this study included the managers at Maropeng, because they were involved in all activities that take place at the site and the educational staff, because they are responsible for the educational activities at the site. Teachers were interviewed because they are expected to know the type of programmes and activities that the site offers, prior to taking learners to the site and also to establish if they gained knowledge and skills concerning EE issues. This method is chosen in order for the researcher to be focused, and to ensure that interviews have been conducted to link with the aims of the study.

(e) Questionnaires

Neuman (1997: 32) mentions two categories of questions that are used in questionnaires, namely open and closed questions. This study made use of the open-ended questions category, because they have the potential to provide a richness in responses, do not have restrictions of a lack of space in the actual questionnaire, may lead to receiving unexpected responses, and allow the researcher to probe deeper into issues indicated by respondees (Gray 2004: 194).

(f) Sampling

Researchers use their special expertise to select the target group when developing purposive sampling (Bruce 1998: 229). For the purpose of this study, purposive sampling was chosen to overcome practical constraints, such as time and feasibility.

(g) Data analysis

In a qualitative approach, researchers use analytic tools such as general ideas, patterns, themes or concepts for making generalisations (Neuman 1997: 419&421). During this research, data was analysed in the following manner:

(i) Coding data by arranging it into categories and subcategories
(ii) Building themes
(iii) Finding patterns
(iv) Showing relationships, similarities and differences (Neuman 1997: 419&421)
(v) Concluding and making recommendations.

(h) Interpretation of data

Data interpretation means the combining of separate ideas in such a manner that it forms a complete whole, Mouton (2001: 109) agrees and further says:

"…interpretation involves the synthesis of one's data into larger coherent wholes, researchers interpret and explain observations by formulating hypotheses or theories that account for observed patterns and trends in the data."

(i) Ethical Concerns

Participants were assured that data would remain private and confidential, with no mentioning of names (Neuman 1997: 291; Berg 1998: 114&115) and that no-one would be offended as a result of the research.

1.9. Summary

An agreement has been generally reached at an international level to implement EE in work environments and in schools, at both non-formal and formal levels. This agreement is also supported at national level here in South Africa. The implementation of EE has not progressed in our country as was anticipated, due to a possible lack of adequate access to appropriate EE resources. As heritage sites are regarded as EE resources, it is necessary to undertake an investigation to ascertain whether heritage sites do offer EE programmes and learner's activities that achieve the learning outcomes and assessment standards of the NCS that address environmental issues. Attention will also be paid to how heritage sites can be improved as EE resources. In order to understand the role of heritage sites as EE resources, a literature review will be carried out in chapter 2.

CHAPTER 1

ORIENTATION

1.1 Introduction

The Federal Register (1992) *in* Clacherty (1995: ii) states that environmental education (EE) seeks to develop the necessary knowledge, understanding, values, skills and commitment to allow people to be proactive in securing a healthy and properly functioning environment that is sustainable (it will still be good for future generations). This is as true for people's local environments as it is for regional and global environments. EE should enable people to understand and interact with their environment in such a manner that the future generations will also benefit from the same environment, starting from local right through to national and global contexts.

EE should take place at both formal and non-formal levels. Formal and non-formal education is seen to be indispensable to changing people's attitudes (Sitarz 1994: 93). In addition, private organisations can make an important contribution to designing and implementing educational programmes (Sitarz 1994: 94). Corsane (2005: 215) is of the opinion that heritage resources have the potential of being vital and dynamic educational assets.

Smith (2001) *in* Simelane (2006: 14) defines non-formal education as:

'Any organized education activity outside the established formal system – whether operating separately or as an important feature of some broader activity that is intended to serve identifiable learning clienteles and learning objectives'.

For the purpose of this study non-formal education is any education that takes place in work places, at botanical gardens, heritage sites, museums, or in any other place outside a formal school set-up offered to people of all ages. The Cradle of Humankind that was proclaimed a heritage site in 1999 (Maropeng 2006: under World Heritage Site; Rainbird, s.a map; Sindane 2003: 1) offers educational activities for visiting educators and learners from schools. It is important to note that heritage sites are regarded as EE resources by the Department of Education (DoE) and some scholars as will be shown below. The question now is: What role can heritage sites play to provide adequate access to appropriate EE resources? As indicated above, private organisations such as heritage sites can make a great contribution to implementing educational

programmes and can therefore contribute positively to education if they implement EE successfully.

1.2 Heritage sites as EE resources

Heritage sites are regarded as EE resources by a number of authors (Corsane 2005: 215; Places 1997-2005: 2; Robben Island Museum Annual Report 2002-2003: 1; Mackeicher & Du Cross 2002: 7; Orbasli 2000: 2). According to Corsane (2005: 215) heritage resources have the potential of being vital and dynamic educational assets. For example, the Robben Island Museum Annual Report (2002-2003:1) has this to say: "We started education on the island museum with empty cement bag paper, we used cement bag papers to make books." An activity involving making books from cement bag papers is in itself part of EE because it involves recycling. Mackeicher and Du Cross (2002: 7) states that heritage sites should be conserved, protected or preserved since they provide some essential educational, historical and economic information. It is imperative to indicate that, when the concept "education" is mentioned in the National Curriculum Statement (NCS), EE is also implied since it is not a formal subject, but seen as a theme that needs to be incorporated into the mainstream of education. To support the approach with EE, just mentioned, Maropeng, the exhibition centre of the Cradle of Humankind, has developed a sustainability wall on which a number of environmental issues are covered (Maropeng 2006: under sustainability).

Abrahams and Corsane (2000: 16) mention that some South African museums and heritage institutions, organisations or agencies have been fighting for survival by claiming that they are valuable educational resources. The authors add that according to the model for empowering heritage educators, some key objectives require heritage educators to help learners at all levels to become aware of the diverse natural heritage resources around them, and what can be learned from studying those resources.

1.3 Reflection on the incorporation of environmental education at different levels:

1.3.1 International level

Heritage sites as EE resources became an issue after general agreements were reached at International conferences such as the Tbilisi, Stockholm and Moscow conferences; reports (Brundtland Report); charters (Belgrade charter) as in Palmer and Neal (1994: 23), as well as

summits (The Earth Summit: agenda 21, and World Summit on Sustainable Development), results stating that EE should be implemented in work environments, and in education at both formal and non-formal level Sitarz (1994: 93). It was, furthermore, agreed that EE is a vehicle that can be used to address environmental issues and challenges as indicated in Bornman (1977:3) the World Conservation Strategy (Palmer & Neal 1994: 23).

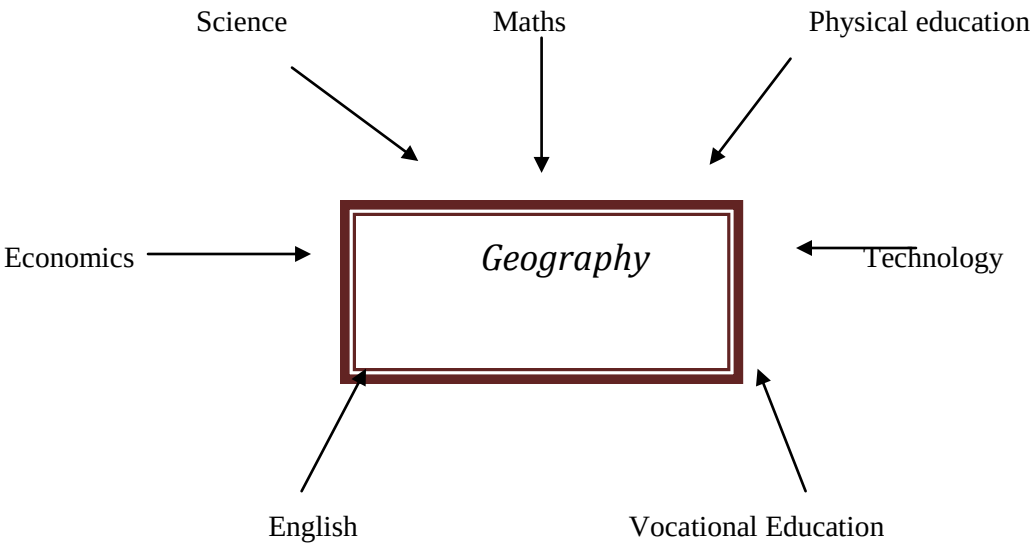
1.3.2 National level

Consideration has also been given to the incorporation and promotion of EE in work environments and in schools at national level in various South African official documents and policies that promulgate the incorporation of EE even at national level. These include, amongst others, the Norms and Standards (2000) formally known as the COTEP document on Teacher Education and Training (1995); the Constitution of the Republic of South Africa (1996); The Green Paper: An Environmental Policy for South Africa (1996); Department of Education (1995), Brunto (2003); Department of Environmental Affairs and Tourism (1998). Resources such as books, maps, magazines and places (environmental education centres and heritage sites) that provide relevant information are essential for the successful implementation of EE. According to Wagiet (2002:30) inadequate access to appropriate learning support materials (LSM) presents serious problems. At the moment obtaining learner teacher support material (LTSM) for teaching in general is problematic, the same applies for EE. If heritage educators could be trained in both the NCS and EE they could provide EE successfully to teachers and learners. EE is interdisciplinary and should use a cross-curricular approach (Tbilisi 1977 :15; Loubser 1997: 26). The interdisciplinary character of EE means that EE should form part of every discipline at tertiary level, and also form part of the content of each subject/ learning area in schools (Tbilisi, 1977: 15; Unesco, 1985: 8). According to the Tbilisi declaration's guiding principles (1977: 15, EE should be interdisciplinary in its approach, drawing on the specific contents of each discipline in making possible a holistic and balanced perspective.

Diagram 1.1 shows that when a discipline, for example geography, is being taught, some information can be drawn from other disciplines, as the arrows indicate. This reinforces the aforementioned, namely that when EE is taught in schools information will also be drawn from other subjects or learning areas, which points to the fact that EE is not merely an independent curriculum or subject, but a theme to be incorporated into the main curriculum. EE is taught in

subjects and learning areas through learning outcomes and assessment standards address environmental issues.

Diagram 1.1 **An interdisciplinary approach**



Loubser (1997: 26).

"*Environmental education should not be just one more subject to add to existing programmes, but should be incorporated into programmes intended for all learners, whatever their age… Its subject-matter should permeate every aspect of formal and non-formal programmes and constitute one and the same continuous, organic process… The central idea is to attain, by means of growing interdisciplinary and of prior co-ordination of disciplines, a practical education oriented towards a solution of the problems of the environment, or at least to make pupils better equipped… to participate in decision making' (Unesco-UNEP, 1987 :10),source (Final Report, Tbilisi conference 1972: 20).*"

Interdisciplinary teaching according to Unesco (1985: 8) refers to teaching where two or more disciplines are integrated because of their interrelationships, while cross-curricular teaching can mean many things. In teaching to a common theme in Design and Technology, a mathematics teacher can help students with the use of language and cross-curricular weeks can be organised during the summer term where projects in the local community can be carried out (Loubser 1997: 25). A further explanation is that cross-curricular dimensions are those distinctive concerns that unite a number of curriculum areas and different fields of knowledge.

A cross-curricular teaching approach for the purpose of this study is an approach in which EE is incorporated in the curriculum and taught at all levels, phases and grades in all subjects and learning areas. Indications are that EE is an approach to education as a whole, rather than being regarded as a subject as mentioned before (Tbilisi declaration 1977: 21). It is important, therefore, to reiterate that EE is neither a curriculum nor a subject, but a theme to be incorporated into the main curriculum.

1.4 Problem description

According to Wagiet (2002: 30) inadequate access to appropriate learner teacher support materials (LTSM) is a widespread problem, and the same problem applies to EE. Successful implementation of EE depends on adequate access to appropriate LTSM by both educators and learners. The author further states that inadequate access to appropriate LTSM is in general problematic. A report of the review committee on the implementation of curriculum 2005, released on 31 May 2000, identifies the lack of LTSM as one of the hindering factors for successful implementation of this curriculum (Department of Education, 2002; under reasons for revision of C2005). Bopape (2006: 102) mentions that the effectiveness of teaching in classrooms is influenced by the teacher's ability to find, use and develop teaching methods and resources that are appropriate for EE. This viewpoint is held by Maila (2003: 38), who says schools face various problems concerning the use of LTSM, the most common ones being availability, quality, and use of LTMS. It is also pointed out that teachers lack time, resources and often skills to develop their own resources. Mudzunga (2006: 121) states that teachers should be involved in resource development at the Schoemansdal EE centre. The author explains that if teachers are involved in the process of developing EE resources they will understand, be able to use, and develop resources themselves, and therefore be able to implement EE successfully.

The provision of sufficient and appropriate LTSM to both educators and learners is essential for the effective implementation of EE. The shortage of EE resources has proven to be a serious issue in South Africa and in the world. The indications are that the large-scale development and dissemination of educational materials has been an issue that has demanded further research in Southern Africa and elsewhere in the world (Taylor & Russo 2002: 39). The lack of sufficient and appropriate EE resources is a problem that is experienced throughout the world and is indeed an issue that needs further research.

In the South African education system, the NCS incorporate EE in terms of critical and developmental outcomes, NCS principles, learning outcomes and assessment standards that address environmental issues and this is seen as an important development (Department of Education 2002: 5&10). Teachers need to be supplied with LTSM that would enable them to teach learner activities that address environmental issues, and therefore implement EE more successfully.

Learners should acquire knowledge and skills that will enable them to identify environmental issues and provide them with the necessary skills to find solutions for the issues. Unfortunately, the lack of adequate access to appropriate EE resources will prevent educators from implementing EE successfully. If heritage sites offered programmes and activities that address the learning outcomes and assessment standards focusing on environmental issues, this would alert educators to the fact that outdoor EE activities differs from a mere school outing. It should be clear to educators that with outdoor EE activities learners must learn and not just participate in a tour. This statement provides evidence of the fact that educators need EE resources that will enable them to teach learners confidently and effectively.

Frohlich (2004: 88) states that unavailability of a set of complete course materials was a challenge to the tutors in a semi-distance EE course in Namibia. The tutors indicate that the late arrival of material has affected the tutoring process negatively. This shows that the availability of resources can play a positive role in as far as the effective implementation of EE is concerned. Heritage educators should therefore be in a position to help educators by providing programmes and activities from which learners can learn while visiting heritage sites. Palmer and Neal (1994: 173) have this to say about heritage sites as EE resources:

"*English heritage provides a full range of information and teaching and learning resources for their 350 plus sites. As with the other countries of the UK the aim is to provide teachers with as much help as possible to make use of the historic environments"*.

Therefore, it is imperative that teachers are provided with help in terms of resources for the successful implementation of EE. According to Corsane (2005: 215), heritage resources have the potential of being vital and dynamic educational assets, while Abrahams and Corsane (2000: 16) indicate that now is the time for heritage educators to act as the new system of education is being

implemented. Heritage educators should really take advantage of the fact that the NCS provides opportunities for incorporating environmental education in teaching and learning.

1.4.1. Problem statement

From the above-mentioned problem description a problem statement is formulated in the form of a main question and sub-questions. The main reason is because questions serve as boundaries around the study without unduly constraining it (Marshall and Rossman 2006: 40), while Locke, Spirdus and Silverman in Kobola (2007: 16) agree by saying questions are the tools commonly employed to provide a focus for thesis and dissertation studies. According to Gray (2004: 187) questions are research tools through which people are asked to respond to the same set of questions in a predetermined order. Andrews in Kobola (2007: 16) mention that the research questions must have the potential for being answered in the project to be undertaken. This means questions are inquisitive in the sense that they warrant answers. The main question and sub-questions of this study are formulated as follows:

The main question:

What role can world heritage sites play to provide adequate access to appropriate EE resources?

Sub-questions

- **What kind of training can be provided to the heritage educational staff to enable them to implement EE effectively?**
- **What kind of training can be provided to the tour guides to enable them to implement EE effectively?**
- **What kind of EE programmes and learners activities should heritage sites provide to teachers and learners?**
- **How can EE resources at the heritage site assist teachers to implement EE successfully?**

1.4.2. Hypothesis

A hypothesis is an expected result (Thomas & Nelson 1990: 13). The authors further indicate that when a person sets out to conduct a study, he or she generally has an idea of what the outcome will be. A hypothesis is an expected answer provided by the researcher during the initial stage of the research. Based on this explanation, a hypothesis is formulated for this study.

World heritage sites will be successful with EE programmes and learners activities if:

1. The educational staff of the site is work-shopped or trained in both the National Curriculum Statement and EE.
2. Learner's activities at the sites are directed at achieving the outcomes and assessment standards addressing environmental issues.
3. The educational staff of heritage sites liaises with the Department of Education.

1.5. Research question

Based on the above-mentioned problem and hypothesis statements the following questions can be asked with reference to the Cradle of Humankind heritage site's EE programmes.

1. How effective are the EE programmes presented by this site?
2. Are these programmes directed at achieving the environmental outcomes and assessment standards as set out in the National Curriculum Statement?
3. Has the educational staff of the site received adequate training to address the prescribed environmental outcomes and assessment standards focusing on environmental issues?

1.6. Purpose of the study

Reference has already been made to the fact that EE materials have been an issue that demands further research in South Africa and elsewhere in the world (Taylor & Russo 2002: 39). Despite the fact that attempts have been made in terms of developing materials for environmental education and the fact that identification of places that can provide EE information has been done (Taylor & Russo 2002: 37; President's Report 1996: 32; Palmer & Neal 1994: 173), it is essential at this point in time to assess the accessibility, appropriateness and effectiveness of these

resources. According to Taylor and Russo (2002: 39) over 200 different educational resource materials have been developed and published in response to the local needs and context. The English heritage provides a full range of information and teaching and learning resources for their 350 and more sites (Palmer & Neal 1994: 173). As mentioned before, it is imperative to clarify the role that heritage sites can play to provide adequate access to appropriate EE since they are regarded as EE resources.

LTSM is important and needs to receive attention if the successful implementation of EE is to be ensured. Wagiet (2002: 30) indicates that inadequate access to appropriate LTSM is in general problematic, and that the same applies to LTSM for EE. This confirms what has been mentioned before, namely that educators experience problems with regard to accessing appropriate LTSM. The provision of appropriate LTSM and knowledge of where to find the material is essential for both educators and learners for the successful implementation of EE. Therefore, the aim of this study is to explore how heritage educators develop EE programmes and activities addressing environmental issues.

1.7. Motivation for the research

South Africa is characterised by a number of policies that promote the implementation of EE through formal and non-formal education. These policies include: the constitution of the Republic of South Africa (1996); the White paper on Education and Training (1995); the Norms and Standards for Educators policy (2000); Brunton et al 2003; Department of Education (2003); and the National Environmental Management Act (1998), to name only a few.

The Constitution of the Republic of South Africa (1996: 11) provides a basis for the incorporation of EE in the curriculum. It states that:

"Every one has the right –

to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that-

(i) prevent pollution and ecological degradation;

(ii) promote conservation, and

(iii) *secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development*."

EE should teach learners to use resources in such a manner that the future generations will also benefit from these resources that include amongst others, soil, fresh air and water. Learners should be taught about conservation of the environment and should be made aware of what sustainable ecological, economic, and social development means. They should also be taught about the manifesto on values, education, and democracy which advocates ethics in the environment, while considering that the constitution links environmental issues to values underpinned by human rights and social responsibilities, and it is pointed out that for this to be realised, EE is crucial. In addition, they should take cognisance of the fact that the constitution links environmental issues to values underpinned by human rights and social responsibilities, and point out that for this to be realised, EE is crucial, taking into account the right to an environment that is not detrimental to the citizen's health or well-being (Department of Education 2001: 74).

South Africa's curriculum, the NCS, is characterised by the critical and developmental outcomes that are derived from the constitution, as well as the principles, learning outcomes, and assessment standards addressing environmental issues (Department of Education 2002: Subjects and Learning Area Policy Documents). The following developmental outcome requires learners to be able to participate in the life of local, national and global communities and it reads:

*"Participate as responsible citizens in the life of local, national and global communities" (*Department of Education 2003: 2)

Learners should, therefore, be empowered with the knowledge and skills that enable them to identify and solve environmental problems in their environments as well as being able to identify and solve problems at national and global levels.

Global warming is considered to be the result of the human impact on the environment. Environmentally literate citizens would assist in the reduction of the negative impact on the environment. All these design features provide opportunities for the incorporation of EE in the curriculum. Some of the learning outcomes and assessment standards focus on heritage issues where learners should be taught the conservation of resources and heritage sites. South Africa's curriculum is underpinned by the NCS principles and one of those promotes the incorporation of EE in the mainstream. All phases which include the foundation, intermediate, senior, FET-general phases as well as all the grades (grades R-12), should comply with this principle: A healthy environment, social justice, human rights and inclusivity (Department of Education 2002: 10).

This research can benefit the country since heritage sites would provide EE programmes and activities that address environmental issues based on recommendations made by this research. Consequently, educators who visit the site can be empowered to implement EE in schools with confidence. A further result will be that the envisaged goal is achieved of developing citizens who are environmentally literate (The White Paper on Education & Training 1995: 22). The result will be environmentally literate citizens who act responsibly towards the environment and, therefore, reduce their negative impact on the environment.

EE can become viable and its goals can be realised by communities that receive it. Consequently, it can enable people to address local environmental issues, by identifying and trying to solve environmental problems at local, national and global levels.

The expected results of this research are:

- The educational staff of heritage sites will receive training and opportunities to attend workshops on both the NCS and EE.
- Heritage sites will offer EE programmes and activities that address environmental issues.

1.8 Research approach, method and design

Qualitative research is oriented towards concrete cases in their temporal and local particularity and starting from people's expressions and activities in their local contexts (Flick 2006: 30). This approach studies social phenomena with various genres including interpretive and uses multiple methods of inquiry (Marshall and Rossman 2006: 2). Case studies are seen as prime examples of qualitative research that adopt an interpretive approach to data, study "things" within their context and consider the subjective meanings that people bring to their situations (De Vaus 2001: 10).

According to Mouton (2001: 194), in qualitative research, the researcher attempts to understand people in terms of their own definition of the world in which they live. In most cases it describes and analyses people's individual and collective beliefs, thoughts, social actions and perceptions. The qualitative approach is employed in order to understand the role of heritage sites as EE

resources, that is, how officials at the Cradle of Humankind (local context) utilise this site as an EE resource.

Yin in De Vaus (2001: 8) mentions that research design deals with a logical problem and not a logistical problem, whereby issues such as sampling, methods of data collection (questionnaires, observation, document analysis), design of questions are all subsidiary to the point of 'What evidence does one need to collect?' Mouton (2001: 185) says that in experiments and surveys, the elements of the research design such as hypothesis formulation and measurement, are specified prior to data collection, while design elements in qualitative research are usually worked out during the course of the study.

In addition, Mouton (2001: 49) mentions possible challenges or limitations of the research process that should be taken into consideration. In that respect, the study may experience a challenge in terms of lack of access to some of the sites since the Cradle of Humankind has fifteen sites that make up the World Heritage Site, some of which are privately owned.

1.8.1 Data collection methods, analysis and interpretation

Merriam (2001) in Simelane (2006: 7) says data is what the researcher considers as useful information for his or her research purposes. According to Mouton (2001: 99), data sources can be classified into various categories for example, observation and interviews. The following methods were employed to collect data: observation, documentation, conducting interviews, and questionnaires.

(a) Observation

It includes participant observation in natural field settings as (Mouton 2001: 99) explains. An observation was done and this method is chosen so that the researcher can have personal experience of what is taking place regarding EE at the Cradle of Humankind World Heritage Site. Observations were done when the educational staff of the site offered lessons and activities to teachers and learners who visited the site.

(b) Document analysis

Various types of documents can be used such as written, oral, photographs, cultural artefacts, public records, personal documents, and physical materials (Merriam 2002: 13). According to Gray (2004: 320), qualitative research can use results from document analysis. This study used document analysis as a data collection method to analyse a document such as Maropeng's teacher resource pack, Maropeng's educational resource pack (written), telephones, and the sustainability wall (which this study regards as also physical, and oral (interviews) .

(c) Interviews

Qualitative interviewing is intended to refer to in-depth, semi-structured or loosely structured forms of interviewing (Mason 2002: 62). The author further indicates that qualitative interviews may involve one-to-one interactions, larger group interviews or focus groups, and may take place face-to-face, over the telephone or via the internet.

(d) Focus group interviews

It refers to the style of interview that is designed for small groups (Berg 1998: 100). The focus group in this study included the managers at Maropeng, because they were involved in all activities that take place at the site and the educational staff, because they are responsible for the educational activities at the site. Teachers were interviewed because they are expected to know the type of programmes and activities that the site offers, prior to taking learners to the site and also to establish if they gained knowledge and skills concerning EE issues. This method is chosen in order for the researcher to be focused, and to ensure that interviews have been conducted to link with the aims of the study.

(e) Questionnaires

Neuman (1997: 32) mentions two categories of questions that are used in questionnaires, namely open and closed questions. This study made use of the open-ended questions category, because they have the potential to provide a richness in responses, do not have restrictions of a lack of space in the actual questionnaire, may lead to receiving unexpected responses, and allow the researcher to probe deeper into issues indicated by respondees (Gray 2004: 194).

(f) Sampling

Researchers use their special expertise to select the target group when developing purposive sampling (Bruce 1998: 229). For the purpose of this study, purposive sampling was chosen to overcome practical constraints, such as time and feasibility.

(g) Data analysis

In a qualitative approach, researchers use analytic tools such as general ideas, patterns, themes or concepts for making generalisations (Neuman 1997: 419&421). During this research, data was analysed in the following manner:

(i) Coding data by arranging it into categories and subcategories
(ii) Building themes
(iii) Finding patterns
(iv) Showing relationships, similarities and differences (Neuman 1997: 419&421)
(v) Concluding and making recommendations.

(h) Interpretation of data

Data interpretation means the combining of separate ideas in such a manner that it forms a complete whole, Mouton (2001: 109) agrees and further says:

"…interpretation involves the synthesis of one's data into larger coherent wholes, researchers interpret and explain observations by formulating hypotheses or theories that account for observed patterns and trends in the data."

(i) Ethical Concerns

Participants were assured that data would remain private and confidential, with no mentioning of names (Neuman 1997: 291; Berg 1998: 114&115) and that no-one would be offended as a result of the research.

1.9. Summary

An agreement has been generally reached at an international level to implement EE in work environments and in schools, at both non-formal and formal levels. This agreement is also supported at national level here in South Africa. The implementation of EE has not progressed in our country as was anticipated, due to a possible lack of adequate access to appropriate EE resources. As heritage sites are regarded as EE resources, it is necessary to undertake an investigation to ascertain whether heritage sites do offer EE programmes and learner's activities that achieve the learning outcomes and assessment standards of the NCS that address environmental issues. Attention will also be paid to how heritage sites can be improved as EE resources. In order to understand the role of heritage sites as EE resources, a literature review will be carried out in chapter 2.

CHAPTER 2

CONCEPTUALISATION AND CONTEXTUALISATION OF WORLD HERITAGE SITES AS ENVIRONMENTAL EDUCATION RESOURCES

2.1. Introduction

A literature review is done to help researchers to limit the scope of their enquiry, and they convey to readers the importance of studying a topic (Creswell 2003: 27). It also shares with the reader the results of other studies that are closely related to the study being reported. Cooper (1984), Marshall and Rossman (1999) in Creswell (2003: 31) say literature relates a study to the larger ongoing dialogue in the literature about a topic, filling in gaps and extending prior studies. This chapter focuses on the literature review.

A World Heritage Site list is available in which World Heritage Sites are listed. In addition, a list of World Heritage Sites that are endangered is published annually in compliance with Article 11 of the World Heritage Convention, the United Nations Education, Scientific and Cultural Organisation (UNESCO) World Heritage Centre. The World Heritage List contains 830 properties forming part of the cultural and natural heritage, which are considered to have outstanding value. It covers 644 cultural, 162 natural and 24 mixed properties in States Parties (UNESCO 1990: 2).

According to the World Heritage List, South Africa has seven World Heritage sites, and some will be shown on the map of South Africa. These are listed below, together with their dates of declaration:

1. The Greater St Lucia Wetlands Park 1999.
2. The Cradle of Humankind 1999-2005.
3. Robben Island 1999.
4. uKhahlamba /Drakensberg Park 2000.
5. Mapungubwe Cultural Landscape 2003.
6. Cape Flora Region Protected Areas 2004.
7. Vredefort Dome 2005.

An area is declared a Heritage Site if it is deemed to have an outstanding natural or cultural value. In South Africa some areas are declared National Heritage Sites by the South African Heritage Resource Agency (SAHRA) and some as Provincial Heritage Sites by a Provincial Heritage Resources Authority (National Heritage Resources Act 25 of 1999). It was mentioned earlier that an area is declared a World Heritage Site if it is deemed to have an outstanding natural or cultural value. This study focuses on the Cradle of Humankind as one of the World Heritage Sites in South Africa; however, the study deems it necessary to start by providing a brief explanation of each of the Sites to highlight the outstanding value that qualifies them to be considered as World Heritage Sites.

2.1.1 The Greater St. Lucia Wetland Park

According to Rainbird Educational cc (s.a. :chart) the size of the site is 234,566 square kilometres and it consists of sixteen protected areas with a 280 kilometres coastline and beaches, stretching from the Mozambique border about 280 kilometres south to the Cape St Lucia lighthouse. Further indications are that the site is one of the largest estuarine systems in South Africa. The park conserves a unique sub-tropical region with various fauna and flora, as well as the various ecosystems that make up the reserve (Rainbird Educational cc (s.a. :chart).

Indications are that the marine ecosystem supports various marine and coastal species and is an important turtle nesting site. It is further indicated that the site consists of some distinct ecosystems, which include the Maphelane Nature Reserve, the St Lucia Game and Marine Reserve, the False Bay Park, Cape Vidal, Sodwana Bay, Lake Sibiya, Kosie Bay, uMkhuze Game Reserve and the Maputaland Marine Reserve.

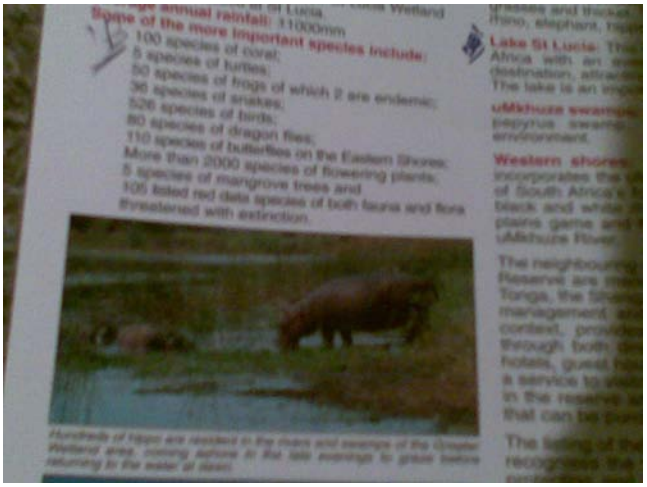


Fig.2.1. Hippo at Greater St. Lucia Wetland area. Source: Rainbird Educational cc (s.a. :chart)

The following are some of the important species found at the Site:

- Coral species – 100,
- Turtle species – 5,
- Frog species - 50, out of which 2 are endemic,
- Snake species – 36,
- Bird species – 526,
- Dragon fly species – 80,
- Butterfly species on the Eastern Shores – 110,
- Flowering plants species - over 2000,
- Mangrove tree species - 5, and
- Listed red data species of both fauna and flora threatened with extinction.

Following the aforementioned explanation, the site is deemed to have outstanding value because it conserves diverse fauna and flora and various ecosystems, some of which are threatened with extinction and also supports a wide variety of marine and coastal species.

2.1.2 Robben Island

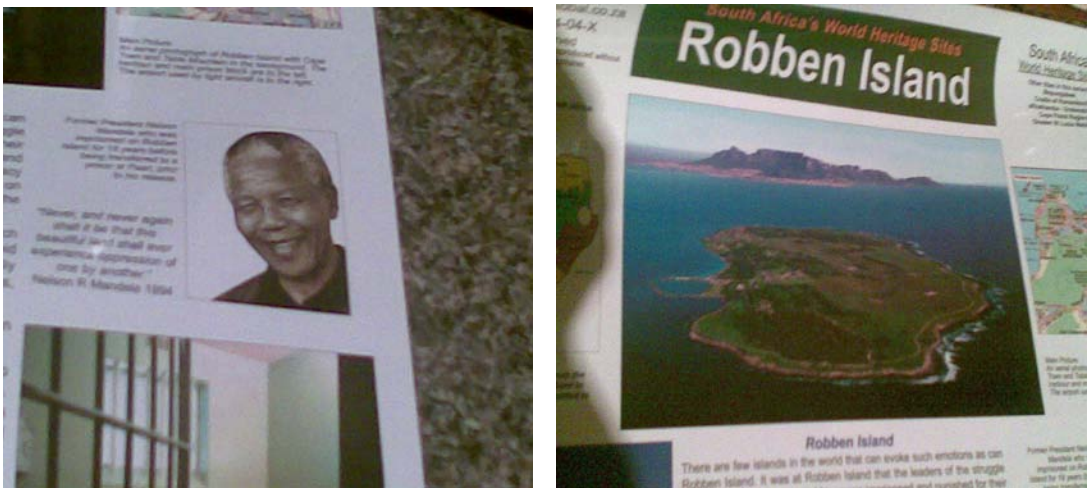


Fig.2.2. Mandela at Robben Island. Source: Rainbird cc (s.a :chart)

According to Rainbird Educational cc (s.a. :chart), Robben Island is located in Table Bay and 12 kilometres north of Sea Point and the size of the site is 5.2 square kilometres. Furthermore, its highest point is 24 meters above sea level and the island can only be accessed by ferry from the Cape Town Waterfront pier. The leaders of the struggle for independence in South Africa were exiled, imprisoned and punished on Robben Island and this has made it a historical World Heritage Site. The word “Robben” means “seal” (Rainbird Educational cc s.a. :chart). This implies that leaders for the struggle did not have freedom of movement. It is further mentioned that there are few islands in the world that can evoke such strong emotions as Robben Island can, since this is the place where the foundation of South Africa’s democracy was planned by the leaders of the struggle while in their cells.

Muslim leaders from the East Indies, Dutch and British settlers, soldiers and civilians, women and anti-apartheid activists, like Nelson Mandela, the first democratically elected president in South Africa and Robert Sobukwe, the founder of the Pan African Congress, were imprisoned on the Island (Rainbird Educational cc (s.a. :chart). The Island is, therefore, regarded as a unique historical and cultural icon and is now a museum and conservancy, which has been established to preserve the integrity of the many historic buildings and the ecology of the island. Its wildlife covers 132 bird species, 23 species of mammals with numerous lizards, snakes and geckos. It is good that the island is listed as a World Heritage site to preserve the integrity of the historic buildings and the unique ecology of the island, however, it would probably be more beneficial

from an EE perspective to the country if the educational staff of the island would develop EE programmes regarding:

- How people who lived there have interacted with the environment.
- Whether they influenced the environment negatively or not.
- How their impact affects us today.
- How the environment is impacted on by those who live there today.

The purpose of granting the island a World Heritage Site status is to recognise and preserve it as a unique historical and cultural icon for ever (Rainbird Educational cc (s.a. :chart). Further indications are that it also preserves the integrity of the many historic buildings and its unique ecology.

2.1.3 Mapungubwe

According to the Rainbird Educational cc (s.a. :chart), Mapungubwe is located 60 kilometres west of Musina off the R752 and situated south of the confluence of the Shashe and Limpopo rivers, a place where the boundaries of Botswana, Zimbabwe and South Africa meet. A population of about 5 000 people is believed to have lived at the site many years ago. Mapungubwe means 'the place of the jackals' (Rainbird Educational cc (s.a. :chart). Indications are that Mapungubwe was first discovered by a local teacher in 1933 and later, a team from Pretoria started with excavations soon after the discovery had been reported and quickly discovered enough evidence to prove that the site truly was that of a sophisticated African kingdom of the past (Rainbird Educational cc (s.a. :chart). It is further indicated that Mapungubwe was the centre for trading from approximately 900AD to 1300AD having well established trade routes starting from the interior to the East African Swahili coast at Inhambane and Sofala South (Mozambique). Other traders include Arabian, Indian and Egyptian traders who were looking for ivory, copper and gold that they traded for glass beads and cloth. Furthermore, it is stated that over one million artefacts were recovered from the site in more than seventy years. This provided scientists with more information about the culture of this Iron Age community. It was declared a World Heritage Site for the purpose of preserving this remarkable outstanding 13th century settlement which is considered to be one of the oldest on the African sub-continent, providing evidence concerning the skills and sophistication of the people living near the Limpopo river who had a unique trading and cultural complex (Rainbird Educational cc (s.a. :chart).

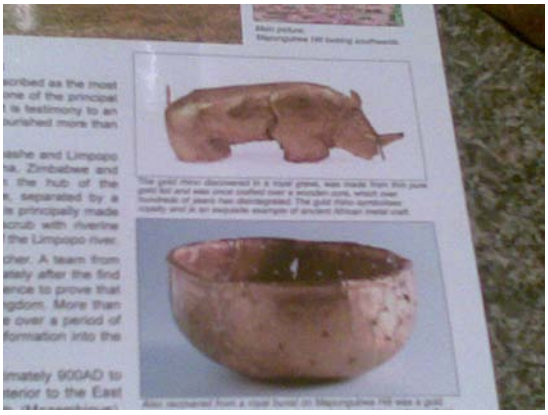


Fig.2.3. Evidence of skills by the Mapungubwe people. Source: Rainbird cc (s.a. :chart)

2.1.4 uKhahlamba Drakensberg Park

The uKhahlamba Drakensberg Park World Heritage Site covers 243 000 hectares and was listed as a World Heritage Site in 29 November 2000 (Rainbird Educational cc (s.a. :chart). Further indications are that the Park was listed as a 'mixed' Heritage Site due to its unique biological diversity, the scenic splendour of the mountains and its richness and the diversity of rock art in the area. The park is one of the 23 sites of this nature (sites of mixed value) that have been listed worldwide. According to the Rainbird Educational cc (s.a. :chart), the fact file of this park is as follows:

- The uKhahlamba Drakensberg Park World heritage Site:
- Has Mafadi as its highest peaks at 3466 meters above sea level and the Injasuti Dome at 3379 metres above sea level.
- Has the highest peak in Southern Africa as Thabana Ntlenyana in Lesotho at 3482 meters above sea level.
- The highest waterfall is the Thukela Falls at 948 meters in five cascades, the second highest waterfall in the word.
- This park is characterised by 35 000 San rock art images in approximately 600 rock shelters.
- It houses 311 bird species, 64 mammal species, 24 snake, 21 lizard and chameleon species as reptile species.
- It has three fish species.

- Seventy-four butterfly species are also found at the park.
- The park conserves 2520 flowering plant species with 13% occurring only at the Drakensbreg site.
- A herd of 2000 eland and a large population of Oribi are found in the park.

These are the unique elements in the park which have contributed to making the park qualify to be listed as a Mixed World Heritage Site. The park shows a variety of important aspects such as numerous incidences of San rock art, the scenic splendour of the mountains and houses a variety of species. The author indicates that bearded vultures that are listed as one of the most threatened species are found on this site where their nests are hidden in holes on sheer cliff faces.

Fig.2.4. Bearded vultures and the San rock art. Source: Rainbird cc (s.a. :chart)

2.1.5 The Cape Flora Region World Heritage Site

The site covers an area of 553 000 hectares, one of the richest but also smallest areas of botanical concentration of indigenous plants worldwide (Rainbird Educational cc (s.a. :chart). Indications are that the site was declared a World Heritage Site in 2004 with the purpose of conserving its scientific importance, which relates to the evolution and the biological processes of the unique Fynbos biome. It is mentioned further that listing of the site will also benefit the region by increasing an awareness of the importance of protecting and conserving this site as it is a unique national asset. Furthermore, there are more than 2600 species on the Cape, while the Cape Flora kingdom has 9600 species with almost 70% being endemic to the Cape, which cannot be found anywhere else in the world. Fynbos refers to the principal vegetation type of the Cape Flora Region which originated from the Dutch word ‘fijn bosch,’ a collective name for a myriad of

evergreen shrub-like plants with small leaves, including plants with leathery leaves that are normally broad and often rolled (Rainbird Educational cc (s.a. :chart). The Cape's Fynbos biome is found at the coastal lowlands, mountain ranges and the drier hinterland.

The author (Rainbird educational cc (s.a. :chart) adds that although its size is small and it covers an area of less than 0, 5% of the land area of Africa, it supports 20% of the continent's flora. The following main plant groups are found at the site, which makes it unique:

(a) Cape Fynbos (health land)

i Mountain Fynbos

ii Lowland Fynbos

iii Grass Fynbos

(b) Cape transitional shrub land (non health land)

i. Renosterveld (small leaved)

ii. Strandveld (broad leafed)

(c) Karoo shrub land (non-health land)

i. Afromontane Forests (indigenous mountain forests)

ii. Forests

According to Rainbird Educational cc (s.a. :chart), some of the Fynbos species like ericas and proteas are exported to international markets since they are sought after for their unique type of blooms. Furthermore, using flowers of the Cape Flora Region has enabled South Africa to continuously win top awards at the annual Chelsea Flower Show in the United Kingdom. Newlands is a suburb in Cape Town where the Kirstenbosch Botanical Garden is situated, the centre for botanical research in South Africa, which was the fundamental reason for the Cape Flora Region's application for listing as a World Heritage Site.

Fig.2.5 Some of the flora at the Site. Source: Rainbird cc (s.a. :chart)

2.1.6 The Cradle of Humankind

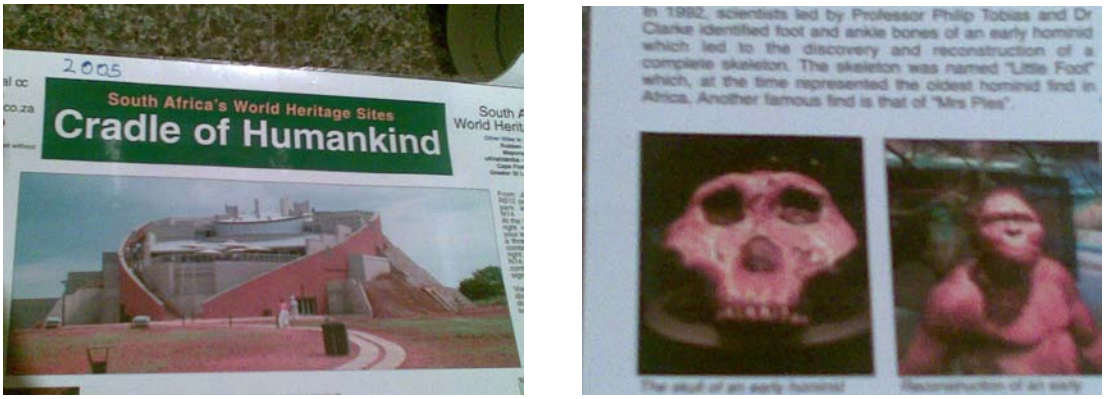


Fig.2.6 The cradle of Humankind and examples of the hominids. Source Rainbird cc (s.a. :chart)

Rainbird Educational cc (s.a. :chart) concurs with the Department of Agriculture, Conservation and Environment (2007:35) that the Cradle of Humankind World Heritage Site covers 47 000 hectares. Indications are that it is a paleo-anthropological site of unique international importance (Gauteng Provincial Government s.a). The site is located in the north western quadrant of Gauteng, according to the Department of Agriculture, Conservation and Environment (2007:35), while the Rainbird Educational cc (s.a. :chart) says the Cradle of Humankind is situated in the Sterkfontein Valley ten kilometres north of Krugersdorp on the borders of the province of Gauteng and the North West Province. The World heritage Site is made up of fifteen sites, namely: Bolt's farm, Swartkrans, Sterkfontein, Minnaar's caves, Cooper's site, Kromdraai, Plover's lake, the Wonder Caves, Drimolen, Motsetse, Gladys vale, Haasgat, Gondolin, Makapan's valley, and Taung (The International Council on Monuments and Sites 2005: 96-99). The study deems it necessary to explain why the date of declaration in chapter 1 does not extend to 2005 as is indicated in chapter 2. This is because some of the sites were incorporated in this World Heritage Site after 1999 like the Taung and Makapan sites which are not covered by some literature. The following is a brief history of the sites that make up the Cradle of Humankind:

(a). Sterkfontein Site

Rainbird Educational cc (s.a. :chart) says more than 500 hominid fossils, thousands of animal fossils, over 300 fragments of fossil wood, and over 9 000 stone tools have been excavated at the Sterkfontein Caves. Sterkfontein is recognised as having the oldest stone tools of any

archaeological site in South Africa, with “Oldowan” artefacts estimated to be between 1.7 - 2 million years old, as explained by the author.

(b). Taung Site

The site is fundamentally of scientific importance since this is the place where the skull of a child had been unearthed (Rainbird Educational cc (s.a. :chart). The skull is reported to have been discovered by Professor Raymond Dart, who named it *Australopithecus africanus* which means ‘Southern Ape of Africa.’ Taung is also a source of fresh water which comes from the limestone cliffs through a succession of attractive pools (the blue pools) to provide water to the communities in the valley below (Rainbird Educational cc (s.a. :chart). It has archaeological sites of which the importance is widely recognised, while it consists of four caves, which include the:

i. Wittrans Cave,
ii. Black Earth Cave,
iii. Equus Cave, and
v. Power House Cave.

Furthermore, the site has a rich series of 19 palaeontological sites that are of extreme importance to specialists in prehistory and palaeontology (International Council on Monuments and Sites, 2005:43). These include:

i. The Dart Pinnacle,
ii. Hirdicka’s Pinnacle,
iii. Hirdicka’s
iv. Dart Deposits,
v. Tobias Pinnacle Deposits,
vi. The Berger Cave Complex,
vii. The Lucky Moon Caves,
viii. The LSN Cave,
ix. The Innominate Cave,
x. The Quinney Cave,
xi. The Cut-through Alley,
xii. The Black Earth Cave,

xiii. Peabody's Equus Site,
xiv. The Equus Cave,
xv. The Blom Cave,
xvi. The Satan Cave,
xvii. The Alcove Cave,
xviii. The Oaxland Large Mamal Site,
xix. The Acacia Cave.

According to the International Council on Monuments and Sites (2005: 43), the site is also characterised by historic and mining sites (vast disused limestone quarries) which are important from a heritage point of view, particularly the Norline Quarry at Buxto, because it has more disused limestone quarries. However, the fundamental reason for the fame of the Taung skull fossil site to be celebrated is the palaeontological and palaeo-anthropological component.

(c). Makapan's Valley

Rainbird Educational cc (s.a. :chart) indicates that the site is located in the Strydom Mountains to the north east of the town of Mokopane in the Limpopo Province and east of the N1 highway. Further information is that in 1925 fossil remains of an early hominid called Australopithecus africanus more than 3.3 million years old, was excavated by Dr Raymond Dart. It consists of the following sites:
i. Palaeontological sites
ii. The Makapans gat Lime works
iii. The Buffalo Cave
iv. The Peppercorn's Cave, Katzenjammer Cave
v. Archaeological sites
vi. The Cave of Earths and the Hyaena Cave
vii. Ficus and the Ficus Iron Age Site
viii Many open sites
ix. Historic sites
x. Makapansgat.

(d). Kromdraai Site

Kromdraai A provided examples of tools and fossil fauna, whereas Kromdraai B revealed more specimens of A. (paranthropus) robustus hominid remains.

(e). Drimolen Site

Hominid remains have been found at the site. Drimolen Site shed light in terms of the remains of the two youngest A. robustus (hominid remains), thought to be eight and twelve months, dating to two million years BP (International Council on Monuments and Sites 2005: 98)

(f). Bolt's farm, Wonder Cave, Minnaar's Caves, Plover's Lake, Haasgat, Gondolin and Cooper's Caves.

Some of these sites have so far produced only faunal remains like Plover's Lake and Bolt's farm, but not hominids.

(g). Gladysvale Site

Hominid remains have been revealed at this site only in the form of teeth and finger bones in 1992, despite the fact that Gladysvale has been known to be rich with fossils since 1936.

(h). Swartkrans

It has the largest collection of A. robustus homonid remains, while it also contains an important number of stone and bone tools, approximately 900 of them dating to 1.8 to 1 million years BP and thousands of fauna remains, as well as evidence in terms of controlled use of fires. This study deems it necessary to point out that some of the information provided concerning each site can or might have changed because research and excavation at the sites have not stopped yet. Indications are that even if some of the sites have not yet yielded hominid remains, they still have the potential of yielding hominids since excavations still continue.

2.2 Definition of concepts

The main concepts that are central to this study have been identified for clarification purposes. This is an attempt to make it easy for readers to understand the study, due to the fact that the clarified concepts are relevant to and have been used within the context of this research study.

2.2.1 Heritage

Heritage is defined as a broad concept that includes tangible assets such as natural and cultural environments encompassing landscape, historical places, sites, built environment, and intangible assets such as collections, past and continuing cultural practices (music, dance, and language), knowledge, and living experiences (UNESCO 2006; UNESCO 2005; Ouzman 2004: 15; Breedlove 2002: 137; Mackeicher & Du Cross 2002: 7 , Abrahms & Corsane 2000: 17; National Heritage Council Act 11 of 1999). As already indicated, heritage refers to assets that can be viewed and touched such as natural and cultural environments, which include: wetlands, archaeological sites, monuments and historical buildings, as well as intangible assets like beliefs and indigenous knowledge.

As part of the intangible heritage, the National Heritage Council Act 11 of 1999 mentions that living heritage - which means the intangible aspects of inherited culture - may include: cultural traditions, oral history, performances, rituals, popular memory, skills and techniques, indigenous knowledge systems, and the holistic approach to nature, society and social relationships. Palmer and Neal (1994: 172) define heritage as:

"…part of environmental education which deals with people living their lives in the past - their homes, artefacts - and in particular how these matters have influenced the environment in which we live now."

This means that heritage also deals with how people have interacted with the environment while living their lives, whether their interaction with the environment has caused damage to that environment or not. Morris (2003: 200) indicates that the history of Driekopseiland's landscape reveals how people have interacted with, and often abused the environment. The author indicates:

"From the spectrum of resources that this environment can be made to yield, many have been exploited - from animals, veld foods and firewood; to water, from springs and rivers; fish; pasturage, and soils for irrigation farming; salt from salt pans; and diamonds from river gravels. 'Dwelling perspectives' are reflected in place names which express emic perspectives on an environment by people living it."

This is an indication that people who lived in this environment had been using resources irrationally, without thinking about future generations and that they would also need sufficient resources to meet their needs. The exploitation of resources also relates to animals, which means hunting was not controlled and, therefore, was practised up to the point of extinction. When talking about rivers and springs, it means the pollution of rivers and springs was a problem to the community that lived in Driekopseiland. Soil has been exploited through grazing since pasturage is mentioned by the author, while on the other hand it might have been caused by incorrect ploughing methods. Trees were chopped down for firewood at such a high rate that entire forests were cleared, leading to extensive soil erosion and infertile and unproductive top soil. Food from the veld, for example vegetables, has been used in such an unstable manner that it cannot be regenerated to be used by future generations.

Heritage educators should take this into consideration and come up with EE programmes and learner's activities that address such gross misuse of the environment. It is essential for heritage educators to make use of their immediate environment as a resource to teach learners and educators the consequences of abusing the environment. They should also point out the advantages of using the environment in a wise manner. The following definition stresses the importance of using resources judiciously to ensure that the future generations can also benefit from them. It defines heritage as follows:

"…that which has been or may be inherited, and involves both previous and future generations. In terms of history heritage is regarded as accumulated experience, an educational encounter, and a contact with previous generations (Oxford English Dictionary in Orbasli 2000: 1).

Ngubane (1998: 3) remarks: *"All of us have heritage - a place from where we come, ancestors and past history."*

The International Council of Museums (1980) in Sinclaire (1996: 3) states that heritage is:

"…that which we inherit." It is a powerful tool for cultural identity, reconciliation and nation-building. It is the sum total of wildlife, scenic parks, sites of scientific or historic importance, national monuments, historic buildings, works of art, literature and music, oral traditions and museum collections, together with their documentations."

The concept 'heritage,' therefore, consists of two categories, namely: tangible and intangible, which may be man-made or natural. A tangible heritage consists of objects - those that can be touched such as buildings, landscapes, works of art, and animals - while an intangible heritage refers to those objects that cannot be touched, such as music, dance, indigenous knowledge, past experiences and skills. A man-made heritage refers to things - that which have been made by people, including, historic buildings, works of art, music, and dance. A natural heritage includes, amongst others, landscapes and animals. The heritage belongs to both present and future generations. This concept also refers to the objects that our ancestors have accumulated and left to their descendents.

2.2.2 Site

According to the National Heritage Resources Act 25 of 1999, a site refers to any area of land, including land covered by water and any structures or objects on it thereon, while Petez (2005: 2); The International Council on Monuments and Sites (2005: 1), defines a site as the works of man or the combined works of nature and man and areas including archaeological sites which are of outstanding universal value from a historical, aesthetical, ethnological or anthropological point of view. A site is also described as referring to any piece of an area occupied by something such as water, structures and objects. All of these definitions share common elements such as structures, buildings that are the works of man on the one hand, and water and objects that are the works of nature on the other hand. This study defines site as a piece of land that may be occupied by buildings, water or any object or feature that may be the result of man's actions or of nature itself and is universally considered to have unique value.

2.2.3 Heritage sites

The Department of Education (2002: 106) says Heritage Sites are places of historical, cultural or environmental importance such as museums, gardens, wild areas and wetlands like the St Lucia

wetlands. The National Heritage Resources Act 25 of 1999 defines a heritage site as a place declared a National Heritage Site by the South African Heritage Resources Agency (SAHRA) or a place declared a Provincial Heritage Site by a provincial heritage resources authority. These sites are declared national heritage sites by the South African Heritage Resources Agency or a provincial heritage site by a provincial heritage resources authority. Heritage sites are categorised according to the study into environments in which they are considered to have value, such as historical, cultural or environmental value.

2.2.4 World Heritage Sites

World Heritage Sites are divided into various categories, such as political, natural, historical and cultural categories. Sometimes they are a combination of two of the above-mentioned categories. It is interesting to note that a site can be a result of combinations of categories. Mapungubwe is both a natural and political site. An example of political heritage sites in South Africa is the Robben Island Museum and examples of natural heritage sites are the St Lucia Wetlands and Mapungubwe. Listing of a chosen site is done by the World Heritage Convention, a body that has been established by the United Nations Educational Scientific and Cultural Organisation (UNESCO). A World Heritage Site is an area that is deemed to have an outstanding universal value (Department of Education 2002: 3; Gauteng Provincial Government: s.a.) and is protected and preserved against threats of changing social and economic conditions and natural decay. These sites are believed to have unique qualities that make them internationally important (Gauteng Provincial Government s.a.).

A World Heritage Site in this study refers to an area of the environment that is considered by the whole world to have some unique value and qualities and is listed on the World heritage list because it is internationally important.

2.2.5 Environment

The Department of Environmental Affairs and Tourism White Paper (1998: 9), says the concept ‘environment’ means different things to different people, and in their policy the term ‘environment’ refers to the biosphere in which people and other organisms live. Chacko (2000: 17) concurs that the term ‘environment’ means different things to different people; where one source may emphasise certain aspects of the environment while another source may emphasise

others. The fact that the concept ‘environment’ is defined differently by different sources may be ascribed to the fact that these authors often work in different fields, where some work in education, and others may write from a geographical, economic or agricultural point of view. The environment refers to the surroundings or conditions in which a person operates and in which an animal or plant lives or operates (Soanes 2002: 274). According to Clacherty (1995: ii), the environment is as much a matter of economic policy and social processes as it is a matter of natural systems and resources. Tselane and Mosidi (1998: 11) state that the environment includes everything around people including people themselves. The Department of Education (2003: 69) says the environment is the: ‘surroundings, or the totality of things that in any way may affect an organism, including physical and cultural conditions, a region characterised by a certain set of conditions, the physical, built and social environment in the context of this document.’

According to Corsane (2005: 366), the term ‘environment’ is not used in an ecological or biological sense as in an eco-museum context. The author indicates that it is a broad concept that includes the geological features, plants and animal communities of a geographical area, people living in the area, the landscapes with which they interacted and which they changed, their traditions, material culture and ways of life. The author’s conception is that people who live in an area interact with and modify their environment, is in agreement with the conception of Morris (2003: 200), Palmer and Neal (1994: 172) who recommend in their definition of heritage that when we study heritage, we should also consider how people who lived in the area interacted with and modified the environment. Tlhabanelo (2004: 18) states that the social environment includes humans and the world humans have created containing aspects such as shelter, buildings, bridges, machines, arts, governments, industries, economics, religions and cultures. Although different authors define the environment differently, similarities do occur. Most authors include people, animals, plants and the built environment in their definition. Considering that the environment means different things to different people, in this study environment means the living and non-living things on earth, as well as the human-made environment.

2.2.6 Education

Education is a life-long process in which knowledge is imparted and skills, attitudes and behaviour are developed. It is a gradual process of which the outcomes are not necessarily tangible or attainable overnight. However, the term ‘education’ embraces both teaching and learning, both educators and pupils/students are learners, and learning should be demonstrated by

output (Tselane & Mosidi 1998: 11). The Department of Education (2000: 14) concur with the above-mentioned authors that education should be a lifelong learning process. The Department of Education (1998: 50) defines lifelong learning as:

"…ongoing learning through a continuously supportive process that stimulates and empowers individuals to acquire and apply the knowledge, values, skills and critical understanding required to confidently and creatively respond and rise to the challenges of a changing social, political and economic environment."

According to Soanes (2002: 261), education is the process of teaching or learning, theory and practice of teaching, or training in a particular subject. Education, therefore, refers to a life long learning process through which people are empowered to gain knowledge, acquire correct behaviour, skills and attitudes that will enable them to deal with the challenges of life, with outcomes being realised after a period of time in the lifetime of a person.

2.2.7 Environmental Education

According to Chacko (2000: 21), there is not a single, adequate definition of 'environmental education,' despite the many attempts that have been made over the years to define this concept. Van Rensburg (1995) in Chacko (2000: 21), states that the concept 'environmental education' is confusing to young environmental educators, as well as to those who have been working in the field of environmental education for many years. EE is a tool for developing environmental literacy (Chacko 2000: 96-97). Both Van Rensberg and Lotz (1998) in Simelane (2006: 14); and Frohlich (2004: 11) point out that EE is a range of diverse educational processes through which we might enable ourselves and future generations to respond to environmental issues in ways that might foster change towards sustainable community life in a healthy environment. The Federal Register (1992) in Clacherty (1995: ii) states:

"EE seeks to develop the necessary knowledge, understanding, values, skills and commitment to allow people to be proactive in securing a healthy and properly functioning environment that is sustainable (it will still be good for children). This is as true for people's local environments as it is for regional and global environments."

The African National Congress (1994: 40) states that EE is a process that leads to responsible individual and group actions which should enhance critical thinking, problem solving and effective decision-making skills, and should take place at all levels.

EE empowers people to be responsible in terms of the actions that they take on the environment, which may be social, political and economical so that they do not over-exploit resources. In this study, EE means empowering people with knowledge, understanding, skills and values so that they secure a sustainable healthy environment as individuals and as a group for the present and future generations. People should be able to deal with environmental issues at local, national and global level.

2.2.8 Environmental education resources

Page et al (1977: 291) says a resource is:

"…anything which can be an object of study or stimulus to the pupil or an aid to the teacher, but normally distinct from the equipment with which such resources are used or made available."

The authors continue to say a resource can include print form, audio-visual and museum items, as well as specimens and items in the locality. The neighbourhood is considered as the richest source of resources for EE, with the support of many other printed, visuals and electronic materials (Palmer & Neal 1994: 163). Palmer and Neal (1994: 163) mention further that in the United Kingdom (UK), the UK Heritage Trust provides a full range of information, teaching and learning resources for sites. In connection with a resource approach, Wagiet (2002: 30) refers to environmental education resources as learning support materials, while Taylor and Vinjevold (1999: 163) mention that the Department of Education regards a range of texts, resources and equipment as Learning Support Materials (LTSM), which may be created from different sources in addition to textbooks. Sources may be print-based, electronic, physical, combinative, human and organisational. It is explained further that each source may include a long list of materials. Print sources include notes, documents, published textbooks, workbooks, reading schemes, newspapers, magazines, supplementary readers, teacher guides and reference books. This study considers environmental education resources as all learner teacher support materials that can facilitate the effectiveness of teaching and learning about the environment.

2.3 Environmental Education programmes at the Heritage Sites, Heritage issues and the curriculum and Heritage educators

2.3.1 Heritage Sites and Environmental Education programmes

World Heritage Sites are considered as a showcase for maximising environmental education programmes (Robben Island Museum Annual Report 2002-2003: 1; Maropeng s.a: under sustainability wall; Places 1997-2005: 2; Makeicher & Du Cross 2002: 7; Orbasli 2000: 21; Corsane 2005: 215). Literature (Robben Island Museum2002-2003:1; Department of Arts & Culture 2006: 5) shows that formal EE programmes are not effectively presented at heritage sites; however, heritage educators or officers do sometimes offer programmes of EE in nature, without them being aware that this is the case.

According to Sitarz (1994: 94), private organisations can make an important contribution to designing and implementing educational programmes. Heritage Sites, as private organisations, are expected to play a role in implementing environmental education as they are regarded as EE resources. The Department of Arts and Culture works in conjunction with the Robben Island Museum to address environmental issues at the site (Robben Island Museum). An integrated management plan has been developed to address environmental issues that pose a threat to the natural environment and pollution on the site. Not only has action been taken to remove alien vegetation from the island, but seventeen horticultural staff members are also currently employed to cut firebreaks, manage the vegetation and assist with fire prevention measures (Department of Arts & Culture 2006: 3-4).

The Robben Island Museum issued a ban on residents in terms of accessing the marine resources such as abalone and crayfish. In addition, this museum has currently contracted a security company for monitoring and controlling illegal poaching activities within the protected zone. Furthermore, provision was made in the 2005-2006 budget to obtain the assistance of school groups to help the Robben Island Museum to keep the coastline clear of litter (Department of Arts & Culture 2006: 5). All these actions are basically EE in nature and they teach environmental education to those school groups involved in the clean-up programme. The museum also conducts a recycling programme. It says: “We started education on the Island with cement bag papers. Those prisoners who built the harbour and the new prison stole empty cement bags for our education inside the cells. We used the cement bag papers to make books.”

It is interesting to note that the museum is sometimes involved with recycling empty cement bags to make books, because recycling is one of the themes in EE. Furthermore, the Robben Island Museum hosts youth camps, also known as nation building camps. During these camps, specific themes such as education and training, and sustainable development are covered (Robben Island Museum 2002-2003: 1). The concept of 'sustainable development' is crucial to EE and was discussed during the world summit on sustainable development in 2002, and the earth summit strategy to save our planet (agenda 21). Today, sustainable development is an issue that is of international concern. The world's concern is to ensure that resources are used judiciously while development is done in a sustainable way. Palmer and Neal (1994: 174) refer to the fact that in the United Kingdom the National Trust conserves an important part of their national heritage which include: historic buildings, gardens, wild areas, and it also creates imaginative preservation projects such as coastal paths, and provides EE facilities, as well as EE programmes.

As indicated in chapter one and in the introduction of this chapter, the Cradle of Humankind is made up of fifteen sites. Maropeng is the exhibition centre of the Cradle of Humankind, and it has a sustainability wall covering almost all of the aspects relating to EE. Among others, it covers themes such as extinction, global warming, the human impact on the environment, diversity, wildlife, and resources such as water, fire, and power (Maropeng s.a: under sustainability wall). According to the official documents (Maropeng s.a: under an educational journey of discovery) educators and learners are taken through the sustainability wall when they visit the site.

The Tswaing heritage site (museum) north of Pretoria is responsible for some developments that include the development of EE programmes, the construction of group accommodation for environmental educational groups with the aid of sponsorships from Goldfields of South Africa and the former Greater Pretoria Metropolitan Council.

2.3.2 Heritage issues and the curriculum

There is a link between heritage issues and the curriculum. Segobye (2005: 80) mentions that heritage education is critical especially for the displaced communities and those in exile or refuge outside the continent, since conflicts in Africa over the past years have displaced millions of people who are now disconnected from their cultural heritage and are, therefore, unable to transfer cultural knowledge to their children. The Department of Education, Arts and Culture provides an opportunity for learners to learn about their history and culture. As part of the Heritage Day celebration in September, there are competitions in poetry, visual arts and drama. Themes such as 'Celebration of our Heritage: History, Values, and Creativity, Our Roots are

Speaking' are covered (Department of Arts & Culture 2002: Chart; Department of Education 2003). Segobye (2005: 80) explains that this project is an attempt to address the imbalances of the past caused by the previous political dispensation. The author's conception supports Heritage Day Celebration, a project that is an attempt to address the imbalances of the past caused by the previous political dispensation. In addition, UNESCO conducts a special project called 'Young People's Participation in World Heritage Preservation and Promotion,' a project co-ordinated by the World Heritage Centre and the Associated Schools Projects Network. Some of the South African schools participate in this project (UNESCO 2001a).

In September 2001, the World Heritage Youth Forum was held in Karlskrona. South Africa was represented by schools from Gauteng Province which include: Reitumetse High School in Soshanguve, Bokgoni High School in Atteridgeville, Clapham High School in Queenswood, and Ngaka Maseko High School in Mabopane (UNESCO: 2001b). Their main message was to tell the people that the first human beings (hominids), as discussed earlier in this chapter, come from Africa, specifically the Cradle of Humankind. The World Heritage Youth Forum is attended by educators and students/ learners. During the World Heritage Youth Forum participants deal with issues pertaining to World Heritage education, with themes including the following: the environmental challenges and the conservation of the World Heritage. The World Heritage forum is a window on the dark and light sides of our past and the World Heritage Forum is a contribution to sustainable development (UNESCO: 2001c). The two concepts, conservation and sustainable development, are central to EE. The project (Young People's Participation in World Heritage Preservation and Promotion), therefore, considers incorporating EE into the curriculum.

EE should be implemented at both formal and non-formal levels as indicated in 1.1 of chapter 1. Both formal and non-formal education is indispensable to changing people's attitudes (Knapp 2000: 36; Sitarz 1994: 93; Bornman 1992: 166). Nthunya (2002: 75) states that the EE policy articulates what government wants to achieve through active environmental learning in formal schooling, while (Keser et al, 2002: 128) says it should not be ignored that formal education institutions play the most important role in achieving EE goals.

Smith (2001: 1) in Simelane (2006: 14) defines non-formal education as any organised educational activities outside the established formal system. Heritage sites can be classified as non-governmental organisations (NGOs) offering non-formal education while formal institutions like schools and universities are also considered to be offering formal education. Heritage institutions can offer organised EE activities since they are expected to provide some essential

programmes that are also educational (Hybers & Bennet 2002: 1). Therefore, heritage institutions can teach heritage issues, which are in line with the curriculum through EE programmes and learner's activities that are designed to address learning outcomes and assessment standards that focus on environmental issues. Knapp (2000: 36) proposes that:

"In particular, we must begin to find new and better ways to combine formal EE efforts with those of non-formal EE. Packaged interpretive experiences that include visits to a variety of sites during a school year could increase the power of the educational message and increase the popularity of non-formal programmes."

The South African Heritage Resources Agency (1999) states that issues relating to heritage resources and their value should increasingly be introduced into school curricula, universities and universities of technology and the agency also encourages the above-mentioned institutions to increase heritage management programmes. Heritage issues are supposed to be included in the curriculum from school to tertiary levels according to SAHRA and the South African government.

Indications are that the English Heritage Trust that controls historic properties and natural areas, provides a full range of information on teaching and learning resources for their 350 plus sites. Teachers are provided with as much help as possible and free catalogues to enable them to make use of historic environments with the availability of a free catalogue. Furthermore, it says:

"England and Wales have series of video teaching on sites compiled on a single video for purchase or free loan. The video's provide an excellent in-service or initial teacher training guidance based on the various subjects of the National Curriculum" (Palmer & Neal, 1994:173)."

This is because EE seeks to ensure the wise use of resources, inclusive of heritage sites so that the same can be enjoyed by the CVF present and future generations (NEEP-GET 2004: 8; National Heritage Council Act 11 1999: 4; SAHRA 1999; Orbasli 2000: 12; Department of Environmental Affairs and Tourism (1998). Some South African museums, heritage institutions, organisations, and/or agencies have been campaigning for the past decade and claim that they are valuable educational resources (Abrahams & Corsane 2000: 16 & 23). The authors continue by saying:

"…with the implementation of the new education system and curriculum 2005 in South Africa, museums and heritage institutions, organisations and/or agencies are finally being offered an

opening where they can prove their full worth. Now is the time for heritage educators to act as the new system of education is being implemented. Within it, heritage educators will be able to move heritage education from the margins to the main area."

Although the authors' argument was based on curriculum 2005 (C2005), the revised version of C2005, the National Curriculum Statement provides opportunities for the inclusion of heritage issues in the curriculum through some critical and developmental outcomes, learning outcomes and assessment standards. Furthermore, the National Curriculum Statement considers the inclusion of heritage issues in some learning areas (social sciences) and subjects (History). Learning outcome four in History Further Education and Training (FET-General) is 'Heritage.' The aim of this learning outcome is to enable learners to engage critically with issues connected to heritage. It covers aspects pertaining to local history; heritage and history are linked to sites, monuments, museums, oral histories and traditions, street names, buildings, public holidays and debates. Kros (2006: 3) says learning outcome four explicitly calls for critical engagement with issues surrounding heritage, and that the use of oral histories is incredibly exciting and a very inviting way of involving people in the study of history. The study of heritage issues covers the conservation of heritage sites and conservation is absolutely essential in EE.

The assessment standards of all the grades (10-12) of the FET level also engage learners with heritage issues. In the subject History, learning outcome one, assessment standard number one for grade ten, for example, requires learners to be able to give the definitions of heritage and public representations and the importance of conservation of heritage sites. Different authors agree on the conservation of heritage and heritage sites (Department of Education 2003: 22; Donaldson & Williams 2005: 167; Vogt 2001: 51). Vogt (2001: 51) investigated the situation regarding a number of forts that were built on the African coast by the Europeans and checked the strategies put in place on heritage sites to ensure their sustainable maintenance and use. Assessment standards two and three in the same grade require learners to deal with knowledge systems including indigenous knowledge, archaeology, oral history and ways in which indigenous knowledge systems contribute in understanding our heritage. In the remaining grades, namely grades eleven and twelve, learners must learn about public representation and commemoration of the past, which includes monuments and museum displays, engage in debates around heritage issues and knowledge systems, analyse the significance of archaeology and palaeontology in order to understand the origins of humans.

"Oral history is regarded as an important part of the new curriculum to ensure that the memories and experiences of ordinary people, those most often left out of traditional history books are listened to. All of us need to see ourselves; our personal history, experiences and perspectives reflected in the history that we study. Our classrooms must become places where all voices are heard." (Department of Education 2003: Chart).

Learning outcome three in Accounting (FET-General) refers to managing resources, with the first assessment standard discussing the use of indigenous bookkeeping systems to gather all information. It is imperative for heritage educators to acquaint themselves with the new curriculum so that their education programmes and learner's activities are not parallel to the mainstream curriculum. Abrahams and Corsane (2000: 23) indicate that, during the process of consultation, an initial list of principles that underpin heritage was drawn up, which state that heritage education should help learners to address critical cross-field outcomes, amongst others. Furthermore, the authors mention that heritage education cannot be defined as anti-racist education, peace education and environmental education. In the new education system, heritage education will be able to move right to the centre of formal education, there will be overlapping of all these spheres at certain points and it will help learners achieve outcomes from the different learning areas of the curriculum. This idea fits well in both the NCS and EE. There is a general agreement that EE is interdisciplinary in nature, not a new curriculum or subject, but a theme to be incorporated into the mainstream of the curriculum, in all learning areas and subjects. Clacherty (1995: 6) points out that EE is not a subject and that it should permeate the curriculum and everything that is done. Heritage issues, on the other hand, are incorporated into the curriculum in History and Accounting at FET. Integration is the point here, which is the policy in the National Curriculum Statement, while the incorporation of EE and heritage issues in the curriculum is shown through the learning outcomes and assessment standards.

When heritage educators teach, they should remember that heritage education is about how people were living their lives and how they interacted with their environment. Morris (2003: 200) cites an example of how the people of Driekopseiland have interacted with, as well as abused the environment, the authors concur with Palmer and Neal (1994: 172) when they state that heritage education is about people living their lives in the past and how their actions have influenced the environment we live in today as pointed out earlier. This brings the integration of heritage education with the curriculum to the fore as well as EE, through learning outcome number four in History for Further Education and Training and learning outcomes from other learning areas and subjects that address environmental issues through integration. At the same time, educators will

be addressing the principle of social justice, a healthy environment, human rights and inclusion. According to the NCS, all phases and grades must comply with this principle. Bopape (2006: 41) indicates that the RNCS, presently known as the NCS and OBE, go against the traditionally driven syllabus, instead focusing on change to infuse EE in all learning areas. In chapter 1, section 1.7, mention is made that EE must be incorporated into the curriculum in terms of the NCS, where learners must acquire knowledge and skills which enable them to deal with environmental issues at local, national and global levels.

According to the newspaper article 'Exposing learners to environmental issues' (2007: under Monde Primary) Monde Primary School, one of the Eco-Schools, has managed to comply with the new curriculum in terms of incorporating EE into the main stream. The paper reports that learner and teacher involvement in the Eco-Schools initiative has helped them to gain knowledge, skills and values concerning environmental issues within their environment. Learners are able to cook food using solar cookers, harvest rainwater to sustain gardens and also to understand the causes of waste and the need to reduce it, to cite a few examples. The learners also learned negotiation skills, as the article reports that the Monde Primary school learners were able to negotiate with the local authorities who finally had replaced the inadequate sewage system in their community. Regarding values, it is mentioned that both the learners' and teachers' attitudes have changed, in terms of the fact that they value and love their environment. The Gauteng Regional Co-ordinator for Eco-Schools observed as follows on the day Monde celebrated its third green flag: "This school is now meeting the goals of the new Curriculum Statement, by producing the citizens of the future who can make well-considered decisions" (Exposing learners to environmental issues 2007: under Monde Primary).

This is true as the aim is to produce citizens in South Africa who are environmentally literate, as indicated earlier, citizens who will apply the four 'r's' practically, namely: reduce, recover, re-use and recycle waste. Pitamber (2007: 30) refers to Moraba who manages waste materials by recycling glass bottles, cardboard boxes and plastic. While Moraba is busy with this task, he also is able to earn a living since he is unemployed. Indeed, many South Africans are unemployed today. Perhaps some of them would be like Moraba if they had been aware of the four 'r's.' Heritage educators are faced with a challenge. The time has come for them to incorporate EE in their education programmes and learner's activities, since they are regarded as EE resources, so that they can make a difference in the lives of those who visit the sites, to the benefit of the country. It is essential for heritage educators to align their educational programmes with the NCS

and infuse EE in all the learning areas and subjects and also make a difference in lives of those who have never had a chance of learning environmental education during schooling.

2.3.3 Heritage educators

The educational personnel working at heritage institutions are referred to as heritage educators (Abrahams & Corsane 2000: 16). The staff should offer educational activities that link heritage education, environmental education and the curriculum. Abrahams and Corsane (2000: 16) state that the new education system provides opportunities for heritage institutions and agencies to make a valuable contribution. This is because some South African museums and heritage institutions or agencies have been fighting for survival by claiming that they are valuable educational resources, as pointed out earlier. They add: “Now is the time for heritage educators to act as the new system of education is being implemented. Within it, heritage educators will be able to move heritage education from the margins to the mainstream.”

The model for empowering heritage educators led to the development of a policy and strategy for heritage education that was achieved through consultative meetings and workshops (Abrahams & Corsane 2000: 21). Some key ideas included in the discussion document are vision, mission, key objectives, principles, a model for curriculum development, advocacy and lobbying, professional development and networking.

According to the discussion document for heritage educators, the vision is to promote the appreciation of the heritage as a valuable resource in education for economic and social empowerment. Education for economic empowerment is linked to the concept of sustainability, where people should be taught that their economic activities should not harm the environment or exploit some of the resources, while the concept of sustainability is central to EE. The mission is to engage the public in the form of learning and action where the heritage is used as a resource for effective education and training. Heritage educators should be able to provide effective education based on the National Curriculum Statement and incorporate EE in the educational programmes and activities. Key objectives state that heritage educators should help learners at all levels to: become aware of the diverse natural heritage resources around them and what can be learnt from studying these resources and bio-diversity, explore the relationship between natural and cultural heritage and to develop an understanding of how people relate to the biophysical and cultural environment. In principle, heritage educators should provide scope for learners to develop the

skills and understanding needed for living in a multi-cultural society within a diverse natural environment through developing multi- and inter-disciplinary programmes. It is imperative that heritage educators are able to link bio-diversity to EE, as it is one of the key objectives of the discussion of the above-mentioned document.

The model 'empowering heritage educators' indicates that heritage education can be measured according to whether or not it has helped learners to respect the natural and cultural resources and landscapes in the total environment, better understand their own natural and cultural environment and their places in it (Abrahams & Corsane 2000: 24). This implies that heritage education should teach learners to understand, respect and use resources wisely. It is indicated further that anti-racist education, peace education and environmental education will overlap at certain points and will aim to help learners achieve outcomes from different learning areas of the curriculum and from some of the fields and sub-fields of the National Qualification Framework. Regarding networking, it is stated that it was important to set up links within the formal and non-formal educational sector by developing: partnerships with non-government and community-based organisations, as well as partnerships with government institutions, both nationally and internationally. Heritage educators should interact with the Department of Education and educators from schools. This will help them to offer programmes and learner's activities that are in line with the curriculum. Knapp (2000: 36) stresses the importance of combining formal EE and non-formal EE by saying:

"In particular, we must begin to find new and better ways to combine formal EE efforts with those of non-formal EE. The similarities between them require that the success of either depends on the development of partnership. Packaged interpretive experiences that include visits to a variety of sites during a school year could increase the power of educational message and increase the popularity of non-formal programmes."

According to the author, attempts have been made to strengthen relationships between the formal educator and the non-formal educator; the example is of Indiana University that initiated community-based environmental education programmes with extensive training experiences that include both interpreters and teachers in the same room during week-long in-service workshops. It is believed that joint effort will help educators to develop closer relationships with non-formal educators and learn as a team how to incorporate EE in the curriculum. This approach will bring

positive results in terms of the effective implementation of EE if it is well-managed, because the two parties can share their experiences and help each other where possible.

Heritage educators are indeed faced with the challenge of incorporating EE and heritage education within the new curriculum, as indicated earlier it is important that these educators are able to move heritage education to the mainstream (NCS grades R-12 curriculum). The new curriculum, the National Curriculum Statement (NCS), provides opportunities for heritage educators to incorporate heritage education and EE through learning outcomes and assessment standards that address heritage and environmental issues. Educators should always bear in mind that EE is not a subject, but rather a theme that is also incorporated into the mainstream. Programmes and activities offered by these educators should address learning outcomes and assessment standards dealing with issues pertaining to the heritage and the environment. These educators need to be conversant with the National Curriculum Statement and EE, to enable them to design activities that will be in line with what is being taught and learnt at the formal level. The fact that heritage sites are regarded as EE resources, offers a double challenge to them because they should be able to incorporate EE and heritage education into the mainstream as they design programmes and activities for educators and learners who visit their sites.

2.3.4 Resources at the Cradle of Humankind

(a) Teacher's resource pack

The Maropeng teacher's resource pack is a document that was compiled for all phases of the curriculum. It provides some background information about the Cradle of Humankind for example, that the Cradle of Humankind World Heritage Site is made up of 15 major fossil sites, with the Sterkfontein caves being the most famous site. The fossilised remains of "Mrs Ples"and "Little Foot" were both discovered at the Sterkfontein caves. In addition, it provides information about the extinction of the dinosaurs that took place 65 billion years ago, tumulus orientation and the sustainability wall. Information is also provided regarding the 'hominids' (human ancestors), because it is generally agreed by scientists that the first humans originated in Africa millions of years ago. The tumulus houses the exhibition for the Cradle of Humankind in Maropeng. Teachers and learners who visit Maropeng are always taken through the tumulus. According to Maropeng (s.a : under an educational journey of discovery):

"*Since opening 6 months ago, Maropeng (the official visitor centre for the Cradle of Humankind World Heritage Site) has been welcoming thousands of school children to experience one of South Africa's most unique educational facilities! Located within 50 minutes' drive from Johannesburg and Pretoria, Maropeng offers a highly educational, fun and memorable experience."*

The sustainability wall shows the human impact on the environment through their activities, which causes serious implications for our planet, like extinction of species and global warming. On the other hand, it shows that population growth has led to strong competition for resources for human sustainability, which include water and land. Issues relating to HIV/AIDS are also highlighted in this document.

After every explanation of a subtopic in this document, mention is made of subjects or learning areas. It is not clear as to whether this is because the topic explained relates to or can be linked to those learning areas or subjects. Therefore, readers are left with questions and they may be tempted to give their interpretation or assumptions. Furthermore, in the foreword the document states that this learning material covers a variety of learning areas and addresses the core areas of the curriculum. Maropeng s.a (under foreword) says:

"Maropeng's education pack has been piloted on both educators and learners and has found widespread acceptance as a unique resource for understanding the new curriculum."

Expectations are that if the material is considered to be addressing the core areas of the curriculum, it should be achieving important elements of the new curriculum, which covers the critical and developmental outcomes, learning outcomes and assessment standards that also address environmental issues. It should be stated clearly which learning outcome is addressed through which assessment standard and for which subject in the learning activities. Readers are left with questions regarding whether piloting had been done before the introduction of the NCS, or whether piloting was done in schools where NCS training had not taken place, since the document has such big gaps. Otherwise, the document should show the above-mentioned essential elements of the curriculum if it is to address the core areas of the curriculum, of the NCS especially. Besides the Maropeng teacher's resource pack, there is a Maropeng educational resource pack in which phases and grades, fundamental principles of the NCS, the bill of rights (particularly the right to a healthy environment), context, critical and developmental outcomes

and the areas in which the pilot study was done, are being mentioned (Maropeng s.a: educational resource pack). A sketch of the planning is also provided in this document. A further explanation of the aforementioned issues will be given next.

(i) Learner's activities

Questions are set for each phase in the teacher's resource pack. However, they do not cover the whole range of question types such as multiple choice, definitions and explanations, compare, why, distinguish to cite examples, which would enable learners to develop holistically. The types of questions set require learners to reproduce answers. Assessment should enable learners to be critical, analytical and creative, as well as to make use of reasoning, which is not reflected in this document. Provision of possible answers to questions is made without indicating how marking will be done, for example, with a rubric.

(ii) The sustainability wall

Sustainability refers to a way of living that meets the needs of the present without compromising the ability of future generations to meet their needs (Department of Education, (2003: 70). This means that as the present generation uses resources to cater for their needs, they should bear in mind that future generation will also need the same resources to meet their needs. The concept of 'sustainability' includes three unique features, namely the environmental; economic and social features (Babier 1998: 1); while Nieuwlands (2006: 3) says: sustainability means that we pay attention to the entire life cycle of our products and to the specific and changing needs of our customers. The author further lists the three components in understanding the definition of sustainability, which are social, environmental and economic responsibility.

The last two definitions share some common grounds in defining the concept of 'sustainability,' such as the economic, environmental and social aspects. Human economic activities may include agricultural practices, the development of malls and business centres, while the social issues can include the development of settlements such as estates, which can all have an adverse impact on the environment if they are not well managed.

Sustainability, therefore, can only be attained when the natural resources are used rationally, which means that our activities will not cause a negative impact on the environment such as erosion of the top-soil, deforestation, desertification, depletion of the ozone layer and pollution of the air, land and water to cite a few examples. The negative impact of humans on the environment

is a reality today. In South Africa the government for example, introduced tree planting day (arbour day) in an attempt to solve the problem of deforestation in the country.

Many topics relating to environmental issues are found on the sustainability wall. Topics include four main elements, namely fire, air, water and earth. Very effective learner's activities relating to environmental education could be designed with these elements, because human sustainability depends on air, water and the earth. Activities could, therefore cover issues around the conservation of these resources. This could align well with the conservation of heritage sites that was explained earlier in this chapter as being important. In turn, this link could extend and achieve learning outcome four and assessment standard one in history grades ten to twelve. Water is the fluid of life and it should be used judiciously and should not be polluted, while the earth is the mother and producer of everything that we eat in order for us to survive.

The sustainability wall shows the human impact on the environment as explained earlier. Human waste products that are illegally dumped such as hospital waste, which includes used needles, cotton wool and empty bottles of medicine, to cite only a few examples. Human impact on the environment also relates to the way human demands put a strain on the environment. It is evident today that we are putting pressure on essential resources such as water, land, clean air and electric power, as well as forests. We have cleared the forests and caused the extinction of wild birds, animals and the erosion of the top soil. Poor farming practice has also contributed to topsoil erosion, which may lead to an unproductive soil for the future generations. The emissions caused by industries, as in agriculture and the chemical industries and some sprays that we use deplete the ozone layer. There is a general agreement that global warming is a result of human actions. Today people are advised to use solar energy and gel stoves in an attempt to reduce the rate of pollution.

The National Environmental Education Project (NEEP-GET 2004: 5) has this to say:

"South Africa is characterised by numerous environmental and developmental issues such as uncontrolled exploitation of forests, marine and coastal resources, soil erosion which reduces the productivity of land for grazing and food production, and inadequate management of pollution and waste. All these issues present threats to habitats, leading to a loss of biodiversity, and a reduction in quality of life options for many South Africans, particularly those that are directly dependent on natural resources to sustain their livelihoods."

The environmental issues highlighted on the sustainability wall are aligned with the concerns and aims of the Department of Education to address Learning Outcomes (LO's) and Assessment Stamdards (AS's) focusing on environmental issues. NEEP-GET aims to help teachers plan lessons that will enable learners to address environmental problems as the Bill of Rights emphasises the need for the sustainable utilisation of resources for the well-being of both current and future generations and a better quality of life for all. It would benefit the South Africans if heritage educators would interact with the Department of Education in terms of designing EE programmes and learner's activities. NEEP-GET also considers teaching learners about the importance of natural and cultural heritage. Breedlove (2002: 136) concur with Sitarz (1994: 295) that educational institutions and heritage sites could benefit from working together. Information on the sustainability is essential, and would benefit the country if educational programmes and learners' activities could cover themes pertaining to those environmental issues reflected on the sustainability wall. Indications, therefore, show that the provision of non-formal education should be designed in such a manner that it links to and supplements formal education.

2.4 Summary

The chapter provides information on how heritage sites are declared and the bodies responsible for declaration of the sites as well as listing of the sites. A brief explanation of some of the South African sites that have been declared World Heritage Sites is outlined. Further explanation is given regarding the Cradle of Humankind as the focus site of the study and a description of the sites that form the Cradle of Humankind. Concepts are defined to make it easier for readers to understand the study, while a discussion on EE programmes and activities at the site, heritage issues and heritage educators is done in this chapter. The resources found at the Cradle of Humankind are also referred to in this chapter. The research method, design and process will be dealt with in chapter three.

CHAPTER 3

RESEARCH APPROACH, METHOD, DESIGN AND DATA COLLECTION TOOLS

3.1 Introduction

The theoretical aspect of the study was highlighted in chapter two, while chapter three presents the research approach, method, design and data collection strategies employed in the actual study. Two approaches are primarily employed by researchers, namely the qualitative and quantitative approaches. This study used a qualitative approach utilizing a case study method, as well as qualitative research data strategies to collect data. All these aspects are detailed in chapter three, while data presentation, analysis and interpretation, as well as the findings of the research will be presented in the subsequent chapter.

3.2 Research approach

Qualitative research contributes to educational practice and is important for educational practice improvement (McMillan & Schumacher 2001: 393). A qualitative approach was employed in this study with the aim of understanding and improving EE practice at the Cradle of Humankind. The prototypical qualitative study of ongoing events is an ethnography, which helps readers understand the multiple perspectives of the situation by the persons studied. Subjectivity in data analysis and interpretation is to control biased ness (McMillan & Schumacher 2001: 16). Qualitative research, according to (Berg 1998: 3), refers to meanings, concepts, definitions, characteristics, metaphors, symbols and description of things. Creswell (2003: 19-20) indicates that in a qualitative approach, knowledge claims are constructivist assumptions in nature that use ethnographic design as a strategy of enquiry and observation, open-ended interviewing, narrative and case study as the methods. Creswell (2003: 19-20) and Merriam (2002: 4-5) concur on the following as the characteristics of a qualitative research approach:

- Interpretive,
- The researcher as the primary instrument of data collection and analysis,
- Is an inductive process,
- .The product is richly descriptive and

- Are content-based.

In this study the researcher will employ an exploratory approach since this is appropriate to the qualitative data collection at the Cradle of Humankind as a case study (Neumann 1997: 33). According to Berg (1998: 7), qualitative techniques permit researchers to explore how people structure and provide meaning to their daily lives. In this study, the researcher wants to understand how EE is implemented at the Cradle of Humankind. The study was descriptive where the researcher described how matters are done at the Cradle of Humankind in terms of implementing EE programmes (activities). As indicated earlier, Berg (1998: 3) mentions that the qualitative approach encompasses meanings, concepts, definitions, characteristics, metaphors, symbols, and descriptions of concepts, while (Neumann 1997: 33) states that field research is used for descriptive studies to collect qualitative data. The methods used to conduct the 'fieldwork' in this study were interviews, observation and questionnaires. This afforded the researcher to interact with the participants and have practical experience as the primary instrument of data collection and analysis.

Mason (2002: 52) states that data generation involves activities that are intellectual, analytical and interpretive. This study was interpretive since the researcher asked questions, analysed and interpreted the provided data in order to understand the issues relating to the implementation of EE about the study in question.

Qualitative studies are also context-bound (McMillan & Schumacher 2001: 16; Neuman, 1997: 420). This research project is a case study that is restricted within the boundaries of the Cradle of Humankind and the case is a unit of analysis. McMillan and Schumacher (2001: 16) indicate that qualitative research develops context-bound generalisations, because the qualitative researcher is convinced that human actions are strongly influenced by the environment in which they occur. According to Neuman (1997: 421), qualitative researchers form new concepts or refine concepts that are grounded in data. New concepts were formed from the collected, analysed data.

3.3 Research method

In chapter 1 at 1.8.1 (v) it was indicated that purposive sampling will be used at the site. Case study methods involve systematically gathering enough information about a particular person, social setting, a group or a site to allow the researcher to understand effectively how it operates or

functions (Berg 1998: 212; Neuman 1997: 32). As McMillan and Schumacher (2001: 423) states, a case study design focuses on one phenomenon which is to understand in depth, despite the number of persons or sites in the study and they concur with the aforementioned statement. The researcher employed the case study research method to gather systematic and thorough information, and to use it as a vehicle for in-depth description and analysis in this study. A further reason for choosing this method was to examine the process of policy implementation in terms of the EE policies existing in South Africa, focusing on the Cradle of Humankind world heritage site. It is important to note that heritage sites are regarded as EE resources and the researcher deemed it necessary to use a case study, because it provides a good opportunity for the investigation and analysis of a unit or phenomenon Jones (2002) in (Merriam 2002: 178-179; Merriam 2002: 8; Berg 1998: 212; McMillan & Schumacher 2001: 548).

A case is a unit of analysis and it is a bounded system since the analysis takes place within boundaries (Merriam 2002: 8; Jones (2002) in Merriam, 2002: 178, McMillan & Schumacher 2001: 398-399), in this case the Cradle of Humankind. The fact that a case study is defined as a unit of study and a bounded system, therefore, permits the possibility that any number of qualitative strategies can be combined with the case study method, with ethnography as the most common one. The researcher incorporated grounded theory with a case study method since ethnographic case studies focuses on the socio-cultural interpretation of a particular cultural group, according to Jones (2002) in Merriam (2002: 179). The selection of the case, in this study a site, namely the Cradle of Humankind, was done purposefully by the researcher (Neuman 1997: 32) for practical reasons particularly regarding time and feasibility as was pointed out in 1.8 (a).

A particular unit was selected for in-depth and holistic investigations. The unit investigated in this study was a world heritage site, the Cradle of Humankind in terms of the EE programmes and learners' activities offered at the site. Mention has been made in chapter one that heritage sites are regarded as EE resources and that the lack of EE resources is problematic throughout the world, to the extent that this phenomenon calls for further research. The focus in this study was on the description and investigation of whether the site participants do offer EE programmes and learners' activities that achieve learning outcomes addressing environmental issues, because the case study searches for meaning and understanding Jones (2002) in Merriam (2002: 178-179). A case study is characterised by an investigation strategy and the outcome is basically descriptive. Ethnography is considered to be the most common strategy amongst the other many qualitative strategies that can be employed, while grounded theory can be constructed out of the data. The

aim of a qualitative study is to build inductively a theory that is grounded in the data (Merriam 2002: 7).

3.4 Ensuring research accuracy

Validity, trustworthiness, authenticity, reliability, credibility and deceptive as well as ethical issues are the fundamental concern of this study (Merriam 2002: 29&422, Neuman 1997: 238&368-369). In field studies, validity refers to the confidence that the researcher places in his or her analysis and the high degree of accuracy with which the data represents the social world in the field (Neuman 1997: 369). To ensure validity, the researcher was personally involved in every stage of the study, especially during the data collection stage which involved close interaction with the participants. The researcher had no intended outcomes that could have biased the study (Mouton 2001: 195; Berg 1998: 39).

According to Simelane (2006: 48), credibility is an attempt to provide authentic accounts of events. For the sake of authenticity, the researcher strived to use most appropriate tools for the study in question (Merriam 2002: 422), with consideration to the context of the study. McMillan and Schumacher (2001: 408) indicate that different strategies may yield different insights into the topic of interest and increase the credibility of the findings. Triangulation, on the other hand, refers to the use of more than one strategy to collect data, Enomoto and Bair (2002) in (Merriam 2002: 184; McMillan & Schumacher 2001: 408; Mason 2002: 33). The researcher used three different strategies to collect data, namely observations, interviews and documents analysis. In addition, subjectivity and context was taken into account Neuman (1997: 369) in an attempt to ensure credibility of the findings.

The researcher employed triangulation and member checks as well as description to enhance trustworthiness (Merriam 2002: 30). In addition, the researcher guarded against deception throughout the study by asking practical questions and probing during observations and interviews (Neuman 1997: 368-369). The issues pertaining to the ethics have already been highlighted in chapter one. Ethical awareness was employed together with the above-mentioned strategies to build confidence in the validity and reliability of the study (Merriam 2002:29; Neuman 1997: 290). This was also done in an attempt to ensure production of trustworthy answers (Neuman 1997: 238). Enomoto and Bair in Merriam (2002: 184) say “Using different data sources, we aimed to triangulate our references to ensure greater data reliability.”

Triangulation was also used to ensure consistency, dependability and reliability of the data generated and findings made in this study.

3.5. Research process: design and methodological strategies

The issues pertaining to the research approach, methods of collecting data and design were first highlighted in chapter one. As indicated in chapter one, Mouton (2001: 185) states that design elements in qualitative research are worked out during the course of the study. McMillan and Schumacher (2001: 166-167) define research design as a plan for selecting subjects, research sites, instruments and data collection procedures in order to answer the research question. In addition, the design indicates the individuals to be studied and when, where, and under which circumstances they will be studied. The research design, therefore, is a framework that guides the researcher on how to collect, analyse and interpret the collected data.

The researcher developed a sound research design in an attempt to provide results that are approximate to reality, thereby ensuring credibility and by seeking to attain results that are judged trustworthy and reasonable (McMillan & Schumacher 2001: 166). The researcher sought to provide a research design that considered the potential sources of error that may undermine the quality of the research and may distort the findings (McMillan & Schumacher 2001: 166).

The study was conducted at one of the South African world heritage sites, namely the Cradle of Humankind situated in Gauteng, as explained earlier in this chapter. The data collection process was carried out by means of observations, document analysis and interviews (Merriam 2002: 12&25), while the human being (the researcher) was the primary instrument of data collection and analysis Jones (2002) in Merriam (2002: 179).

The researcher employed an observation strategy, because observational data represent a first-hand encounter with the phenomenon of interest, in contrast with a second-hand encounter or report, where data is collected by means of an interview. The researcher was involved as a very active participant observer, since she was participating while observing (Merriam 2002: 13; Mouton 2001: 196). The second method the researcher employed was document analysis, as well as interview strategies. This covered the analysis of written documents found at the Cradle of Humankind. Highly structured interviews were used where specific questions were asked and the order in which they were asked was determined in advance. This was done in an attempt to gather

holistic information and to understand whether EE programmes and learners' activities that address environmental issues, are offered at the site since heritage sites are regarded as valuable EE resources. In this study, the human being as an instrument of data collection and analysis Jones (2002) in Merriam 2002: 179) was deemed the most suitable instrument.

3.5.1 Research design

Research design is the actual plan of how to conduct a specific study, in other words the process of data collection, analysis and interpretation (Berg 1998: 27). According to McMillan and Schumacher (2001: 166-167), the research design shows the individuals to be studied, when, where, and under which circumstances they will be studied, as indicated earlier. A research design, therefore, is a comprehensive plan or sketch of how the researcher will conduct the research project. As mentioned earlier in chapter one, in qualitative research, design elements are worked out during the course of the study (Mouton 2001: 185). The researcher listed all the questions that will be asked and all questions were directly related to the objectives of the study in question (McMillan & Schumacher 2001: 268). The researcher had visited the site prior to the actual research process. This was done with the aim of having an overview about the site in question just before the actual process could start. A summary of how the pre-research activities and the period at which the pre-research activities were conducted are shown in table 3.1.

Table 3.1: Schedule for data collection method

Date	**Activity**	**Data sources**	**Data collection methods**	**Research questions**	**Research objectives**
7/9/2006	Observations of how EE programmes and activities are offered at the site.	Heritage educators	Observations	How do heritage educators offer EE programmes and activities at the site?	Understanding the way in which the heritage educators integrate EE programmes and activities when they

					teach.
4/4/2007	Analysis of the sustainability wall	Sustainability wall	Document analysis	How the sustainability wall is used in terms of the site as an EE resource?	To understand the impact that the sustainability wall has on teaching EE at the site.
7/9/2007	Face-to-face interviews	Heritage education officer.	Unstructured interviews	What can you say about heritage sites as EE resources?	The researcher's aim was to understand as to whether heritage educators are aware that heritage sites are regarded as EE.
7/9/2007	Face-to-face interviews	Heritage education officer.	Unstructured interviews	What can you say about heritage sites as EE resources?	The researcher's aim was to understand whether heritage educators are aware that heritage sites are regarded as EE.
				Which EE programmes and activities	The researcher wanted to know if there were

				do you offer at the site?	EE programmes and activities that are offered at the site.

3.5.2 Data collection tools

Data refers to information that is relevant to the study. Data that is relevant for the study were collected through three major qualitative data collection tools, namely; observation, document analysis and interviews (Merriam 2002: 25). Data were collected with the aim of answering the research question.

(a) Observations

Observation as a method of data collection was mentioned in 1.8.1(c) in chapter one and this is the main method of data collection for the study. Observing participants' behaviours by participating in their activities is one of the most important elements of data collection. (Creswell 2003: 21). Berg (1998: 39) mentions that doing qualitative research with subjects entails being permitted to observe or take part in the lives of these subjects, which may be viewed as a social contract in which the two parties have a say about the content of the agreement and about regulating the relationship. Data that were collected through observations relate to the EE programmes and activities offered by heritage educators and guides at the site. These are EE programmes and activities offered to school groups that visit Maropeng (Maropeng s.a) and the Sterkfontein caves, as well as EE offered to private visitors because EE should be taught to people of all ages. Observations also provided data that relate to EE in terms of the sustainability wall, as well as how the people who lived at the site interacted with the environment as it was pointed out earlier in 2.2.1 of chapter two Morris (2003: 200). This study deemed it necessary to know whether people who lived at the Cradle of Humankind did exploit the environment or not. Observation involved verbal and non-verbal interactions.

It was indicated in chapter one (section 1.8.1 (h)) that ethics will be observed during the study. Ethics generally refers to beliefs about what is right or wrong, proper or improper, good or bad

(McMillan & Schumacher 2001: 196) even if some degree of disagreement about how to define what is ethically correct in a research exists. The researcher took ethical issues into consideration, as was pointed out in section 1.8.1 (i) of chapter one, and below are some of the ethical aspects that were observed.

- Permission was obtained from the manager of the Cradle of Humankind to access the site, since it is important for the researcher to obtain such permission before embarking on this type of research (McMillan & Schumacher 2001: 421; Berg 1998: 39).

- The purpose of the study was explained to the participants by the researcher (Merriam 2002: 29; McMillan & Schumacher 2001: 421; Goodwin 2007: 44)

- The researcher dressed in a fashion similar to the respondents, since the way one dresses is very important in this type of research and the researcher was friendly, relaxed, pleasant and interested in the welfare of the participants (McMillan & Schumacher 2001: 270).

By considering the stated ethical issues, it enabled the researcher to establish a comfortable relationship and rapport with the participants in this study (McMillan & Schumacher 2001: 270). Comprehensive and extensive notes were taken during the observation process to build up a data base for data analysis as observations were done continuously throughout the study. Although observation provided first-hand information of the study, in context interviews were employed to provide additional information, such as the history of how people who lived at the site have interacted with the environment, which could best be obtained through interviews. In addition, interviewing is the most commonly used technique in qualitative research (Mason 2002: 62). Interviewing techniques are relevant to this study, as the study employed a qualitative approach.

(b) Documents analysis

Various types of documents can be found such as written, oral, photographs, cultural artefacts, public records, personal documents and physical materials (Merriam 2002: 13). In this study documents analysis was done on documents obtained at Maropeng, which included the teacher's resource pack, the Maropeng educational resource pack and information on the sustainability wall. These documents were available at Maropeng before the researcher's visit and, therefore, they are considered to be credible (Merriam 2002: 13).

(c) Interviews

Although observations provided first-hand information, interviews were conducted to provide information that could not be obtained during observations, because they cannot provide all the information needed.

Qualitative interviewing is described by Mason (2002: 62) as an in-depth, semi-structured or loosely structured form of interviewing and it includes one-to-one interactions, larger group interviews, or focus groups (Mason 2002: 62). McMillan and Schumacher (2001: 443) says in-depth interviews require open-response questions to obtain data of regarding participants' meanings, the way they perceive and explain and even make sense of important events in their lives. Focus group interviewing is defined by Berg (1998: 100) as the style of interview that is designed for small groups as it was defined earlier in chapter one. Preliminary interviews were done with the purposes of understanding as to whether the heritage educators teach EE programmes and activities at the site and this is shown in table 3.1.

The study also employed one-to-one interactions with educators who visited the site, because interviews may be more formal with one person than with a group (McMillan & Schumacher 2001: 437). In addition, focus group interviews were held with the managers and heritage educators of the site. Interviews were used since they are flexible and adaptable and the researcher is directly involved by interacting with the subjects. Responses could be probed, followed up, clarified and elaborated in order to achieve specific and accurate responses as qualitative in-depth interviews are characterised by these probing procedures and not by their particular question formats (McMillan, & Schumacher 2001: 267&446). It is important to note that interviewing is regarded as the most commonly used technique in qualitative research.

Topics and themes that the researcher wished the interviewees to discuss were developed by the researcher with a flexible structure of questions to allow the researcher and the interviewees to develop unexpected themes further (Mason 2002: 62). The researcher used open-ended questions, since qualitative interviews require asking truly open-ended questions (McMillan & Schumacher 2001: 446) and participants were asked the same questions in the same order that reduced interviewer flexibility (McMillan & Schumacher 2001: 444).

In order to elicit credible and dependable information from the participants, the inquirer observed the following ethical requirements:

- Privacy and confidentiality were guaranteed to the participants, in order to increase truthful answers to questions (Neuman 1997: 238; Merriam 2002: 29, Berg 1998: 31).
- The researcher devised roles to elicit co-operation, trust, openness and acceptance and also assumed a helping role (McMillan & Schumacher 2001: 420).
- The researcher was careful not to ask threatening questions to respondents in order to elicit sincere and honest answers and avoided social desirability bias (Neuman 1997: 238).
- The investigator avoided using trick questions with the aim of tripping the interviewees up (Mason 2002: 79).
- Consent was sought from the respondents prior to audio taping and taking notes of their responses (Simelane 2006: 54; Berg 1998: 31).
- The researcher ensured that the rights and welfare of the subjects were guaranteed (Berg 1998: 31).
- The enquirer negotiated with the participants to make them understand the rights and power that they had in the research process (McMillan & Schumacher 2001: 422).

(d) Questionnaire

Neuman (1997: 32) mentions two categories of questions, namely open and closed questions. The study employed the open-ended questions category.

Table 3.1 Preliminary interview schedule

Date	**Type of interview**	**Interviewer**	**Interviewees**	**Aim of the interview**
07/05/2007	Face-to-face	Researcher	Heritage education officer	To understand whether the heritage educators teach EE programmes and activities at the site.

The researcher pilot tested the questions to get feedback on the questions before they were used in the study, to check for bias in the procedures, the interviewer, or the questions themselves (McMillan & Schumacher 2001: 267; Neuman 1997: 240). The pilot was done with a few colleagues.

3.6 Data analysis

Data analysis is done on an on-going basis and is done simultaneously with data collection across all stages of the study (Merriam 2001: 15; McMillan & Schumacher 2001: 462; Neuman, 1997: 420). Data analysis was carried out after every observation session and interview. This has enabled the researcher to adjust and modify the data collection process and also to test emerging concepts, themes and categories against subsequent data (Merriam 2001: 14; Neuman 1997: 420). Data analysis began with the initial observations, interviews and the first documents accessed at the Cradle of Humankind. The data were organised according to the research questions (McMillan & Schumacher 2001: 467). Data collected from a unit of data that included any meaningful word, phrase and narrative, were compared with another unit of data with the aim of finding patterns across the data, after which these patterns were given names (codes), redefined and adjusted while the analysis continued (Merriam 2002: 14). Recurring codes indicating their importance are then combined to form themes (Goodwin 2007: 46).

3.7 Summary

The focus of this chapter was on the explanation of qualitative as the research approach and the case study as the research method selected for this study. Further explanations were given regarding the research design, schedule and the data collection tools for this research. Issues pertaining to the presentation, analysis and results obtained from the collected data will be presented in the subsequent chapter.

CHAPTER 4

PRESENTATION, ANALYSIS AND INTERPRETATION OF DATA

4.1 Introduction

The qualitative research approach that was selected for this study was discussed in chapter three. The rationale behind selecting the qualitative approach was also explained in that chapter, while the researcher also considered measures to ensure research accuracy. In addition, the research design and methodology were also dealt with in chapter three. In this regard, it was explained that the main research method that was used was a case study. In addition, the data collection tools were identified

The researcher made use of observations, document analysis and interviews in an attempt to understand how heritage educators integrate the EE programmes and learner activities with the NCS in the programmes they present at the Cradle of Humankind. The chapter first presents data obtained from observations, document analysis and interviews as indicated in section 3.5 (Merriam, 2002: 12 & 25), as well as data obtained from the questionnaires. The results of all the processes mentioned in chapter three are presented in chapter four.

4.2 Data from observations and findings

Observations were carried out during the tours through Maropeng and the Sterkfontein caves presented to teachers and learners by the site guides, as well as when the Maropeng marketing officer presented talks to the natural science teachers from district 14 Observations are important for qualitative research (Berg, 1998: 39).

4.2.1 Observations at Maropeng

At Maropeng, teachers and learners were given information by guides on issues pertaining to the Cradle of Humankind such as the origin of humankind, how humankind developed over time, the stone tools it used, the map of the Cradle of Humankind and the sites that are all part of the Cradle of Humankind. These are the sites that were discussed earlier in section 2.1. Next, the educators and learners were taken through the exhibition area known as the tumulus that was designed to resemble an ancient burial mound. The display of the first man is the biggest attraction in this exhibition. On the extreme right hand-side of the tumulus, is the Sustainability

Wall that deals with a number of environmental issues, which offer a good opportunity for the site to integrate environmental activities. These include the four main elements of life namely air, fire, water and earth as indicated earlier in section 2.3.4(b). Despite the good opportunity that the sustainability wall offers for teaching environmental activities, the Maropeng guide never referred to this aspect. It is left to the teachers and learners to read the information on their own. Undoubtedly, this was an ideal opportunity for the tour guide to promote integrated environmental activities.

Observations were also done when the educational marketing officer made presentations to natural science teachers from Gauteng Department of Education district 14 in Johannesburg. The researcher formed part of the teachers who sat down and listened while taking notes. Social sciences formed part of the introduction in which the presenter indicated that heritage sites are identified and conserved for different purposes. For example, the St. Lucia Wetland site is conserved, because it provides a habitat for many species which sustain the ecosystem. On the other hand, the Cradle of Humankind is conserved because this site marks the historical origin of man. In addition, indigenous vegetation of the site is also conserved. The presentation on the conservation of species provides natural science teachers and learners with ideas on how to use the external environment to teach about environmental issues. In this instance integration with the curriculum was done well.

4.2.2 Observations at Sterkfontein

Here the focus was on Mrs Ples, ‘Little Foot,’ the death trap, the underground lake and how previous cultures used sticks to indicate time. The visitors (teachers and learners) were told that Mrs Ples was the first evidence uncovered that proved that humankind lived at the Cradle of Humankind and Mrs Ples (now believed to be Master Ples), dating back 2.5-million years, is currently referred to as the missing link between hominids (human beings) and apes because it does not show all the convincing features of human beings. The ‘Little Foot’ that is currently being excavated, is creating considerable attention and is an almost complete ape-man skeleton that is estimated to be 3.3-million years old. Significantly, no environmental issues were addressed at the time of the observations.

The death trap is a hole on the surface of the earth that goes deep into the caves. The ‘Little Foot’ was one of the creatures that fell into the caves through the death trap. The hole is called the death

trap, because it is believed that living organisms were doomed to die after falling through this hole. There is also an underground lake that has clear running water.

4.3 **Data from documents and their results**

An intensive study was done of documents obtained at the site. Three documents were found that cover aspects that relate to education and environmental issues at the site, namely:

1. The teacher's resource pack,
2. Maropeng educational resource pack, and
3. The Sustainability Wall

The following were discovered as a result of the analysis of the above-mentioned documents:

4.3.1 The teacher's resource pack

1. The document is in line with the NCS and it covers the foundation phase (Grades R-3), the intermediate phase (Grades 4-6), the senior phase (Grades 7-9), and further education and training (Grades 10-12).

2. It provides an opportunity for the integration of EE in the curriculum for example, it refers to the Sustainability Wall on the extreme right hand side that showcases issues relating to humans' impact on the environment and how resources are divided between the rich and the poor worldwide (Maropeng s.a: under heading 'tumulus orientation'). An analysis of data on the Sustainability Wall will follow the discussion of the Maropeng resource pack. Sustainability is one of the EE concepts that the heritage educators would emphasise when educators visit the site, since it is related to sustainable development which teachers and learners must know about and must apply in real life today.

3. The three important resources namely, oxygen, water and the earth are listed as the essential elements that support life on earth. In this regard, it would be possible to integrate EE with the curriculum by referring to the pollution of these resources, how to manage them and their judicious use.

4. Telephones are installed in the exhibition centre. Visitors merely have to pick up the receiver to listen to recorded information on extinction. Teachers and learners can listen to the recorded history of those animals that lived on earth in earlier times, but are now extinct, such as the dodo. The heritage educators could teach educators from schools not to kill wild animals because they can become extinct; consequently, the future generations will not have the opportunity of ever seeing such animals. This should be done with the hope that when educators leave the site, they will be able to impart that knowledge to the learners. Educators should be informed about the NCS principles covering a healthy environment, the learning outcomes as well as the assessment standards that address environmental issues in the educational talks.

5. A question regarding the meaning of a heritage site, namely '*What is a Heritage Site*?' was asked. This question relates to social sciences in the senior phase, but nothing was said about the relationship between social sciences, the environment, the curriculum and heritage. The relevant learning outcomes and assessment standards should have been identified and educators should also have been shown how environmental issues could be integrated to heritage aspects, especially conservation.

4.3.2 **Maropeng educational resource pack**

The document covers the following aspects of the NCS that contain elements of EE.

1. The fundamental principles of the national curriculum statement are stated in this document that covers, amongst others, social justice, a healthy environment, human rights and inclusivity. However, this principle is not implemented in practical terms in either the activities or in the lesson plans. All the phases including the FET band must integrate these principles during the teaching and learning process. In this way, EE would be integrated as learners are taught about a healthy environment, but the guide did not deal with this aspect. In addition, EE refers to the Bill of Rights that says: "Everyone has the right to: an environment that is not harmful to their health or well-being, and have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures." (Maropeng educational resource pack s.a: under the heading 'Bill of Rights').

This matter was discussed earlier in this dissertation when it was explained that when we use the environment to satisfy our needs we should also think of future generations. This is another opportunity to address environmental issues such as pollution, which may include air, water and land pollution (littering) and their impact on human life. The so-called factors, namely air, water, earth and fire are also written on the sustainability wall since they are considered to be essential for human life.

2. The critical and developmental outcomes are spelled out clearly. Critical outcomes number one and six provides opportunities for the integration of EE. Critical outcome number one reads: "identify and solve problems and make decisions using critical and creative thinking," while critical outcome number six says: "use science and technology effectively and critically showing responsibility towards the environment and the health of others." According to the critical outcomes, it implies that human activities have a negative impact on the environment because of the use of technology, resulting in extremely negative implications for our planet, the rapid extinction of species and global warming. Therefore, it is important for learners to be able to use technology in a sustainable manner so that the environment is not harmed.

Developmental outcome number one says: "participate as responsible citizens in the life of local, national, and global communities." (Maropeng educational resource pack s.a: under heading 'critical outcomes'). Regarding critical outcome number one, an explanation could cover issues such as the identification of land pollution and ways of solving this problem and also making informed decisions. This could be combined with developmental outcome number one, because citizens should be responsible in terms of local, national and global communities. Global warming can be cited as an example of an environmental issue such as the negative impact of human interaction on the environment that affects the whole world today.

4.3.3 The Sustainability Wall

It was indicated in section 4.3.1 that data analysis of the Sustainability Wall will follow that of the Maropeng educational resource pack. The Cradle of Humankind is characterised by a long underground chamber, called the tumulus, in which the main exhibition is housed. The Sustainability Wall is found on the extreme right hand side of the building in the tumulus (Maropeng Teacher's Resource Pack s.a: under the heading 'tumulus orientation'). Issues dealt with on this wall relate to the human's impact on the environment and how the resources are

divided between the rich and the poor across the world. Further issues that are discussed include: extinction, the four main element forces, dumping by health services, diversity, deforestation and ways of creating energy in an attempt to reduce the negative environmental impact of electricity provided by Eskom.

(a). The four main elemental forces

The Sustainability Wall displays the four elemental forces which include air, water, earth and fire. Mention is made of how these element forces have affected our development as a species (Maropeng Sustainability Wall). Lessons could be developed for teaching EE at the site, based on the three elements and would include pollution, resources and the judicious utilisation of resources, for example. Opportunities are, therefore, available for heritage educators at the site to teach environmental activities to teachers and learners who visit the site, due to the four elements' forces being central to EE.

(b). Dumping of rubbish

The Sustainability Wall also shows a dumping place where the dumped rubbish -especially that which comes from hospitals - poses serious health risks for the community staying near the hospital. Children may take some of the dumped rubbish and eat it or inject themselves as they are unaware of the dangers posed by those dumped items. Effective environmental activities could be planned, which could be taught to learners who visit the Cradle of Humankind, dealing with indiscriminate and negligent dumping of hazardous materials. This could help warn children not to pick up anything in the dumping areas. In addition, learners would be made aware that dumping is not supposed to take place anywhere else than in a specified area.

4.3.4 Telephones

Telephones are installed in the tumulus. Educators who visit the site, pick up telephones and listen to recorded information about extinction. Extinction is an EE concept that is crucial for teachers to integrate with the main curriculum; however, the tour guide did not refer to the concept of 'extinction.' This was not surprising, because during the interviews the education marketing officer explained that the guides only present general information. The dodo which was discovered on the Indian ocean of Mauritius in 1598, is cited as the most famous example of

recent extinction in modern times. The large flightless bird was extinct by 1681, having been killed off by humans, dogs and pigs. Since extinction is an EE concept, a lesson on this topic could be developed and taught to both teachers and learners who visit the Cradle of Humankind. These telephones could also serve as resources for teaching environmental activities at the Cradle of Humankind. Worksheets based on extinction could be developed for both teachers and learners to complete.

4.4 Data obtained from interviews and the results

Data that is collected from fieldwork must first be assessed in order for the researcher to analyse only the data that is essential (Goodwin, 2007: 45). The interviewees' responses were transcribed and read carefully with the aim of making sense out of these responses. The coding of data was done during analysis and recurring codes were combined to form themes since this shows their importance. Topics and themes that the researcher wished the interviewees to discuss were developed by the researcher with a flexible question structure to allow the researcher and the interviewees to develop unexpected themes as was explained earlier in chapter three. The structure of the questions forms the basis for the categorisation of data and for their analysis.

Two Maropeng officials were interviewed, because the researcher wanted to understand whether the Cradle of Humankind offers environmental programmes and activities to learners and teachers who visit the site. The interviewees were representatives of the management. One of them is also Maropeng's' education marketing officer responsible for educational presentations to teachers who visit the site. The education officer was interviewed to gather data on heritage educators at the site, teaching environmental activities at the site, heritage issues, environmental activities and the curriculum and environmental activities at the Cradle of Humankind. A tape recorder was used to record the interviewees' responses and notes were also taken by the researcher because a human being is the primary instrument of data collection and analysis (Jones, in Merriam, 2002: 179) as explained in section 3.5.

Ten copies of questionnaires consisting of sections A and B were sent out to teachers who visited Maropeng for completion. Ten questionnaires containing section A were returned; while only seven questionnaires containing section B were returned. Interviews were also conducted with two teachers based on an interview schedule similar to section B of the questionnaires to have equal responses with section A, and also to enhance reliability of the results. One of the

interviews was conducted face-to-face and the other interviews were conducted telephonically. Face-to-face interviews were conducted when the researcher visited the school.

4.4.1 Biographical data of participants

Biographical data was collected from ten educators who participated in the study by completing a questionnaire and, also, from the Maropeng education marketing officer. The data was collected with the intention of acquiring information about their positions, experience, training and qualifications. The researcher deemed it necessary to gather such data since it provides some background information about the participants as the people who should use heritage sites as EE resources, while the Maropeng education marketing officer should present lessons to teachers and learners. The data obtained from the responses revealed that ninety percent of the participants were females, while ten percent were males.

The length of their experience in years in their occupations ranges from 0-10 years, 11-20 years and 21-30 years with the majority falling within the last two groups. Data was collected from a reasonably experienced and well-qualified group of participants with their qualifications ranging from primary school teachers diploma's to an honours' degree. This ensures the reliability of data. Most of the participants were teachers (7 cs1 educators), with about five percent being heads of departments and the Maropeng education marketing officer. None of the participants had received training in EE. Ninety-nine percent of the participants had received training in NCS at Departmental workshops; while one percent had enrolled for a diploma at an institution of higher learning for NCS.

4.4.2 **Data on Environmental Education policies obtained at the site**

One representative from the management and an education marketing officer were interviewed in order to understand issues pertaining to EE policies at the site as indicated earlier. The researcher took notes while a voice recorder was used to record responses from the interviewees (Simelane, 2006: 54; Berg, 1998: 31). The site does not currently have EE policies in place, but the issue is being discussed. However, this does not mean that the site focuses only on what has happened in the past, but also on the present and future; hence the issue of sustainability is regarded as important today, according to one of the interviewees. As mentioned in section 2.2.7, Frohlich

(2004: 11) and Simelane (2006: 14) allude to the issue of sustainable community life in a healthy environment.

The site operates according to UNESCO laws that it had to sign, must uphold and operates in partnership with UNESCO. These laws address environmental issues which include recycling, water conservation, preserving indigenous vegetation, alien plants, littering, pollution and absence of fire at the site. The site is committed to recycling, whereby cans and bottles are collected from the Maropeng bar for recycling which is in line with what was discussed earlier in section 2.3.1 (Robben Island Museum Annual Report, 2002-2003: 1; Department of Arts and Culture, 2006: 5).

Water is perceived as an essential resource and, therefore, conservation of the resource is put into practice. Indigenous plants are preserved, while action is taken to remove the alien plants to prevent competition for food and water, for example the pom-pom weed project. The Cradle of Humankind embarked on a project to uproot the pom-pom weed from the site. The removal of alien plants was mentioned earlier in section 2.3.1 as an activity that is practised by the Robben Island Museum. Some alien plants grow larger than indigenous plants and pose a danger of killing them (indigenous plants). The Cradle of Humankind planted 2000 indigenous plants to ensure their sustainability and indigenous grass is left uncut to allow it to grow tall.

This is done with the aim of maintaining the natural status of the site and to set an example in terms of conservation practice. On the other hand, littering, pollution and fire are prohibited at the site. People who wish to have a picnic at the site should bring cooked food with them, because they will not be allowed to make fires for a barbeque. In addition, the site saves electricity by switching the lights off in rooms where nothing is taking place and also at night time. All visitors are prohibited from entering these premises, because they will cause the site to lose its cleanliness and identity. Furthermore, the site works closely with government departments such as the Departments of Education, Environmental Affairs and Tourism, Water Affairs and Forestry and Agriculture, Conservation and Environment respectively.

Linking environmental activities at the site to environmental activities with the Department of Education is done through schools and districts that visit the site. The researcher had the opportunity to observe the Maropeng education marketing officer doing presentations to teachers from district 14. There is an understanding on the part of the manager that natural resources are

linked to the NCS. In this regard, learners' activities are linked to LO's that address environmental issues such as looking after the natural resources to sustain life, resources that are linked to the exhibition, especially the sustainability wall and installed telephones that link the visitors to recordings about extinction as explained earlier on in this chapter. The interviewees stated that they also deal with diseases such as malaria and HIV/AIDS in activities that they carry out, to which the Department of Education is also committed.

The Department of Environmental Affairs and Tourism drew up some environmental rules for the site to practise, for example regarding pollution. The site ensures that pollution is prohibited and visitors, including school children, are made aware that they should not litter; while on the other hand they are warned not to make fires that may destroy the vegetation, especially the indigenous vegetation. The Departments of Water Affairs and Forestry and Agriculture, Conservation and Environment respectively, ensure the conservation of water and the environment. Mining activities that used to take place at the Cradle of Humankind have been stopped because the management want to conserve the identity of the site. The Rand Water Board ensures the conservation of water.

The Cradle of Humankind interacts with environmental education centres and botanical gardens, for example Mogale's Environmental Education Centre and the Environmental Education Centre within the Walter Sisulu National Botanical Garden. The Environmental Education Centre within the Walter Sisulu National Botanical Garden help the site with identifying plants, while learners who visit the site are sometimes sent to Mogale's Environmental Education Centre to learn more about issues pertaining to the environment. In addition, the centre develops some worksheets for learners to complete.

Significantly, at the presentations, there was no mention of the link with other heritage sites except that there is a heritage environmental management company which is responsible for travel and accommodation.

4.4.3 **Data on heritage educators at the site and their responses**

One person is responsible for the presentation of formal educational activities; however, a representative from the management was also present and took part in the interviews; therefore, they constituted a focus group (Berg, 1998: 100). The official is called an educational marketing

officer at the site and not a heritage educator. The study will call her the heritage educator in line with the term used in literature as was stated in section 2.3.3 (Abrahams & Corsane, 2000: 16). Guides were also observed. The EE concept is explained by the heritage educator as a theme that is integrated with the National Curriculum Statement (NCS). The heritage educator learnt about the concept at RNCS (now NCS) departmental workshops while she was still a district facilitator. Although she never received training regarding EE, she believed that it was important that she should be trained because environmental issues are being addressed in all the learning areas.

The site interacts with the national Department of Education, certain provincial education departments and ultimately the schools. The national Department of Education should first approve their CD's (Compact Discs) containing activities offered to teachers and learners. Approved CD's are then distributed to the various provinces, which then distribute them to districts and to schools; in this way teachers taking learners to the site also receive the CD's. They have been interacting with all the provinces in South Africa with the exception of Kwa-Zulu Natal and the Cape (Northern, Eastern, and Western provinces). They believe that it is important to interact with the Department, because it assists them to align with the curriculum and to get approval from the national Department of Education since learners are the main target audience of the site.

Knapp (2000: 36) also recommends that schools should visit heritage sites. The indiscriminate and irresponsible dumping of hazardous materials referred to on the Sustainability Wall, which is done by the Health Department, should form part of the presentation done either by the guides or the heritage educator when the health officials visit the site. In this regard, there is interaction with certain departments such as the Health, Sports and Recreation and Defence Departments respectively, which normally visit the site for information sharing and focus more on the origin of man than on environmental activities.

4.4.4 **Data on teaching environmental activities at the site and the findings**

A hands-on method is employed when learners are engaged practically with environmental activities out of the classroom situation. Cleaning of the Robben Island Museum by the Department of Arts and Culture and Robben Island Museum involving a group of learners is an example (Department of Arts and Culture 2006: 5). This can assist teachers to differentiate between taking learners out of the classrooms and outdoor environmental activities. Learners are

taken out into nature to collect samples, for example, they fetch water and do tests on whether water is clean or not. They may go out again to compare the differences between alien and indigenous plants, and cleaning the earth (littering). Learners are then made aware of their four senses, namely, hearing, seeing, touching/feeling, and smelling some grass and trees.

The site's target group is learners, but if teachers want learners to learn about issues pertaining to the environment, they should make special arrangements beforehand, because tour guides usually focus on explaining general issues that are of interest to the site. This will enable the marketing officer to make arrangements with Mogale's Environmental Education Centre for the presentation of activities connected with the environment.

It is interesting to note that the indigenous grass is left uncut and lawn is not allowed on the premises so that birds, snakes and other species, whose natural habitat is the grass itself, will be able to survive, because if the grass is removed they will leave the area in search of another appropriate habitat. The aim is also to teach learners about the conservation of the indigenous vegetation and species. Environmental activities focus mainly on the sustainability of resources and species; hence the sustainability wall. Although the site does not interact with environmental education clubs and associations there is close interaction with environmental education centres and botanical gardens.

4.4.5 **Data on heritage issues, environmental activities, the curriculum and the findings**

Issues regarding the integration of heritage, environmental activities and the curriculum were discussed in section 2.3.2 (Segobye, 2005: 80; Palmer & Neal, 1994: 173; Abrahams & Corsane, 2000: 16 & 23). The NCS is characterised by LOs and ASs, some of which address environmental or heritage issues. This simply means that environmental and heritage activities are integrated with teaching the curriculum. Heritage sites all focus on various aspects of conservation. The Cradle of Humankind tries to conserve information about the origin of the first man in the world, which results in the conservation of resources such as water, indigenous vegetation and electricity as explained earlier in this chapter. The St. Lucia Wetland Site is conserved, because it is a habitat for many species.

The interviewees did not indicate whether there are opportunities to link the curriculum with environmental and heritage activities and why it is important to link them. Neither the heritage

educator nor the representative from the management were aware of the World Heritage Youth Forums but believed that it is important that they interact with such forums. The researcher provided the interviewees with the forum's details at the end of the interview process since she was also playing a helping role as indicated earlier in section 3.5.2 (b) (McMillan & Schumacher, 2001: 420). The interviewees believe that both the site and the learners could benefit from the mutual interaction as the site would empower learners with information while learners would share quality information with other countries and, therefore, advertise the site.

4.4.6 Data on resources for teaching environmental activities at the site and their findings

Despite the fact that world heritage sites are regarded as EE resources, there are subsidiary resources that are used to teach environmental activities. These include the teacher's resource pack, the Maropeng educational resource pack, the Sustainability Wall and telephones installed in the exhibition hall. The Sustainability Wall displays a number of environmental issues and is, therefore, the main source.

The collected data shows that the ancestors of humans who lived at the Cradle of Humankind, did not exploit the environment in terms of water pollution, soil erosion, animal extinction, destruction of veld foods, deforestation and over grazing. It was explained in chapter two that the 'heritage' concept is part of environmental education which deals with people living their lives in the past, their homes and important artefacts and in particular how these aspects have influenced the present environment (Palmer & Neal, 1994: 172). Morris (2003: 200) mentions that the history of Driekopseiland's landscape reveals how people have interacted with and ultimately exploited the environment. The researcher wanted to know if the people who lived in the Cradle of Humankind did not abuse the environment as they interacted with it.

Qualitative researchers form new concepts or refine concepts that are grounded in data (see 3.2). The following aspects emerged from an analysis of the data collected from the Maropeng officials (Merriam 2002: 14; Neuma 1997: 421).

(a) Projects: The pom-pom weed (Campuloclinium macrocephalum)

The pom-pom weed (Campuloclinium macrocephalum) is one of many invasive alien plants in southern Africa that are regarded as weeds at the site, especially at Maropeng. The Maropeng

staff took it upon themselves and embarked on a project of uprooting the plants. It was mentioned that they had to uproot it, because if they cut it the pom-pom weed can grow again. One of the Maropeng officials indicated that the plant should be removed while it is young because if it is allowed to grow it develops seeds that stick to peoples' clothes which may be problematic for visitors. Alien plants are also removed to ensure the sustainability of indigenous plants. These types of plants have a tendency to grow bigger than the indigenous plants and also compete for food and water.

(b) **Indigenous plants/grasses**

The Cradle of Humankind deems it necessary to conserve the indigenous vegetation at the site. This is the reason why lawn or flowers are not planted at the site. The Maropeng education marketing officer indicated that they planted an extra 200 indigenous plants at the site. Furthermore, indigenous grass is left uncut to ensure the original status of the site. Efforts were also taken to stop mining activities that were taking place at the Cradle of Humankind so that the site's status is maintained.

(c) **Partnership - UNESCO**

The collected data reveal that the Cradle of Humankind is in partnership with UNESCO that is responsible for the listing of world heritage sites, as was also indicated in section 2.1, hence the Cradle of Humankind has strict laws which the staff have to obey. Failure to heed these laws may result in a situation where it will lose its status as a world heritage site.

(d) **Pollution**

Pollution - such as littering and air pollution - is strictly prohibited at the Cradle of Humankind. In addition, people who wish to have a picnic at the Cradle of Humankind should bring food that requires no cooking because fires are not allowed at the site. In this way, air pollution is prevented and this is also done to avoid any risk of fire damage at the site.

(e) Recycling

Recycling is one of the important activities that are undertaken at the Cradle of Humankind. It was explained earlier in this chapter that cans and bottles are collected from the Maropeng bar and sent for recycling.

4.4.7 Data on educators who visited the site and the results

Data collection in this category was collected by means of questionnaires and interviews on a one-to-one basis (Mason, 2002: 62), because interviews may be more formal with one person than with a group (MacMillan & Schumacher, 2001: 437), as explained earlier in section 3.5.2 (b); while a questionnaire containing similar questions was also used to ensure the reliability of the data. It appears the educators understand that the concept EE refer to the fauna, flora and how man interacts with the environment and that they should teach learners not to destroy the environment. Some teachers simply say it pertains to education about the environment. For example, learners are taught about pollution and non-renewable resources, how to preserve water and also not to destroy the ozone layer. The collected data, therefore, reveals that educators know what environmental education is. Educators learnt about the concept from various sources, such as: workshops at environmental education centres, national botanical gardens and National Geographic DSTV programmes, while some educators learnt about the concept when they did planning because they found LO's and ASS's, which address environmental issues and the educational trips such as the celebration of wetlands and day trips where environmental issues are addressed.

Three of the educators indicated that during their visit to the site they gained knowledge on general content of social sciences, one learnt about the dangers of dumping and the importance of recycling as it appears on the sustainability wall, and another three gained knowledge about human evolution, namely that the first human originated in South Africa and how humans developed over time. Mrs Ples (or rather Master Ples) is the first evidence that humans originated in Africa and that they are our ancestors who used stone tools. Attention was never given to environmental issues. This can be aligned to data on teaching environmental activities at the site; in addition, the education marketing officer remarked that if educators want learners to be taught about environmental activities they should make prior arrangements with the guides as they only

present general information about the site in their talks. If special arrangements are made, some of the EE activities can be offered at Mogale's Gate.

A few of the educators stated that they learnt that the four elements, water, fire, earth and air are life giving elements. About 5% of the educators teach environmental activities practically by organising cleaning campaigns and visiting wetlands; while the rest (95%) do not provide clear information on how they teach environmental activities. Again, it is not clear how the visit to the site helped them to link environmental activities with the curriculum. This is no wonder because the educators gained more general knowledge than knowledge about environmental activities since arrangements are not made prior to the visit.

There is no clear response about why a questionnaire on environmental issues should be set for learners when they visit the site. Many of the educators did not respond to the Sustainability Wall question despite the fact that they had visited the site more than once. Only a few indicated that the Sustainability Wall teaches people about the resources on earth and how they are shared amongst the rich and the poor. These are the educators who read the information on the sustainability wall as a matter of interest. There is no clear indication of the linking of environmental education resources with the Cradle of Humankind.

(a) Fauna

The collected data revealed that teachers understand environmental education to be education about the animals of the area. This means teaching learners about the importance of animals that form part of the ecosystem.

(b) Flora

Teachers understand the concept 'environmental education' to refer to the transmission of information about the plants of their area and especially conservation of the environment.
In addition, learners are taught about the importance of plants. It is understood that cutting down trees may lead to deforestation which may worsen the erosion process.

(c) National Geographic programme on DSTV

The collected data revealed that the National Geographic programme on DSTV focuses on geo-wild. It shows the importance of the environment as it provides a habitat in which animals live. In addition, people are taught about ecosystems; the information they are given can range from information on animals that feed on grass (herbivores) to information about those animals that feed on other animals (carnivores). The teacher can teach learners the importance of conservation of the environment. On the other hand, the programme teaches that fire may decrease the level of oxygen in the atmosphere, while oxygen ensures human survival. People are advised not to start fires because they burn and kill trees that emit oxygen into the atmosphere as plants give out oxygen during the day.

4.5 Summary

The chapter focuses on the presentation of data, data analysis and the interpretation of data. The collection of data was done by means of observations, document analysis and interviews which were combined with data obtained from a questionnaire, mainly completed by teachers who visited the site. Data was presented, analysed and interpreted in this chapter. The recommendations of this study will be dealt with in chapter five.

CHAPTER 5

RESEARCH SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

Presentation of the research results was done in chapter four. The topics and themes that the researcher wished the interviewees to discuss were developed by the researcher within the framework of a flexible question structure to allow both the researcher and the interviewees to develop unexpected themes. The structure of the questions formed the basis for the categorisation of data and the analysis of the data. Eight new concepts emerged from the analysis of the data as they were grounded in the collected data.

The focus of this study was to assess the accessibility, appropriateness, and effectiveness of heritage sites as environmental education resources (see section 1.6). The study investigated the effectiveness of the Environmental Education (EE) programmes presented at the site, whether these programmes are directed at achieving the environmental outcomes and assessment standards as set out in the National Curriculum Statement (NCS), and if the educational staff of the site received adequate training to achieve the prescribed environmental outcomes and assessment standards addressing environmental issues (see section 1.5). The summary and conclusions of the research are provided in this chapter. Comment is made on questions that formed the basis for the categorisation and analysis of data that addressed the research question and sub-questions. In addition, the recommendations, research limitations and areas for further research are dealt with in this chapter.

5.2. Summary of research findings

The summary of the data that relate to heritage sites as environmental education resources and new concepts that were formed is provided below.

5.2 1 Observations at Maropeng

The results reveal that the guides at the Cradle of Humankind only present information on the history of the site and focus on the map of the site especially the sites that comprise the Cradle of Humankind (as mentioned in section 2.1), the origin of humans, how they developed over time and the stone tools they used (see section 2.6.1). Teachers and learners are then taken to the exhibition area where the display of the ancestors forms the centre of attraction for visitors. The sustainability wall found in the tumulus

shows many environmental issues which include: dumping, air, water, fire, and earth as was explained in section 2.3.4 (b) However, the guides never addressed these issues.

The results indicate that the education marketing officer tried to link environmental issues to the social sciences as well as to the natural sciences in her introduction during a presentation to teachers from district 14. Mention was made that sites are identified and conserved for different purposes such as the St. Lucia Wetlands that are conserved because they are the habitat of many species while the Cradle of Humankind is fundamentally conserved for historical purposes, which results in the conservation of indigenous vegetation (see sections 2.2.3, 2.2.4 and 4.2.1). The Department of Education (2002: 3) and the Gauteng Provincial Government (s.a) cited in section 2.2.4, agree with the notion that world heritage sites are conserved for specific reasons. In defining a world heritage site they point out that it is an area that is perceived as having an outstanding universal value, which is protected and preserved against threats of changing social and economic conditions and natural decay.

5.2.2 Observations at Sterkfontein

The results indicate that focus was on the history of the Sterkfontein caves, the explanation of Mrs Ples, “Little Foot,” the death trap, the underground lake and how the old people used sticks to show time as explained in section 4.2.2.

5.2.3 Document results

The results include data pertaining to the teacher’s resource pack, the Maropeng educational resource pack and the sustainability wall.

5.2.3 (a) The teacher’s resource pack

The teacher’s resource pack refers to grades R to 12 of the NCS. The results reveal opportunities for integrating environmental issues with the curriculum, especially issues that relate to the sustainability wall, which include the human’s impact on the environment, how resources are divided between the rich and the poor and the three main elements of life, namely air, water and the earth and a question on the meaning of heritage as explained in sections 4.3.1 (b), 4.3.1 (b), 4.3.1 (c) and 4.3.1 (d).

5.2.3 (b) Maropeng educational resource pack

The results indicate the fundamental principles of the National Curriculum Statement of which one is social justice, a healthy environment, human rights and inclusivity and the critical (CO) and developmental outcomes (DO). A healthy environment calls for all people, including present and future generations to respond to environmental issues in a manner that ensures community life in a healthy environment (Chacko, 2000: 96-97; Frohlich, 2004: 11; RDP, 994: 40 and Van Rensburg & Lotz, 1998 in Simelane 2006: 14) see section 2.2.7.

5.2.3 (c) The sustainability wall

A number of environmental issues are indicated on the sustainability wall. The results indicate environmental issues such as the human's impact on the environment, how resources are divided between the rich and the poor across the world, extinction, the dumping of hazardous materials, the four main elements, diversity, deforestation and ways of creating energy as an alternative to Eskom electricity. The issues on the sustainability wall align with the Constitution of the Republic of South Africa (1996: 11) in section 1.7 when indicating that all people have to secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development. Bopape (2006: 7-8) agrees that the sustainable use of resources by environmentally literate and active citizens will ensure that every one in South Africa in the present and the future will enjoy a decent quality of life through the sustainable use of resources.

5.3 Recordings available via telephones

Information on animals that are extinct is available on recordings that can be accessed via telephones as revealed by the research. The dodo is one example of some of the animals that are extinct. Wagiet (2002: 30) defines environmental education resources as learning support materials (see section 2.2.8). This implies that anything that can be used to facilitate effective teaching and learning in EE is a resource and so are the telephones at the Maropeng exhibition hall.

5.4 RESULTS FROM INTERVIEWS

5.4.1 Biographical data

The results show that the educators' experience falls into three groups ranging from 0 to 10 years, 11to 21 years, and 21 to 30 years, with the majority falling within the last two brackets. The teachers are experienced and their qualifications range from a primary school's teacher's diploma to an honours degree. Ninety five percent of the participants were educators while five percent were heads of departments. None of the participants had received training in EE; they had only received training at departmental workshops. Ninety nine percent of the participants had been trained in NCS by the Department while one percent had enrolled for a diploma at a higher learning institution.

5.4.2 Data on Environmental Education policies at the site

The research results indicate that EE policies are not available. Issues relating to the past, present and future are dealt with; hence the idea of the sustainability wall which relates to sustainable community life in a healthy environment as explained in section 2.2.7. Bopape (2006: 19) focuses on two of the 27 principles contained in the Rio Declaration on the environment and development, which support the notion of sustainable development that meets the needs of the present and future generations. Principle one reads, "Human beings are the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with the environment while principle three says: "The right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations." Issues of environmental education policies supporting the integration of EE at national level were first discussed in section 2.3.2.

A partnership has been signed between the site and **United Nations Educational Science and Cultural (**UNESCO) (see sections 2.1 and 2.2.4) to which the site should abide according to laws covering aspects such as recycling, water conservation, preserving indigenous vegetation, alien plants, littering, pollution and the absence of fire at the site as mentioned in section 2.3.1. While the Cradle of Humankind recycles bottles and cans obtained from the Maropeng bar; the Robben Island Museum prisoners recycle empty cement bags to make books. Pitamba (2007: 30) shows the need and benefit of recycling when saying, Moraba who manages wastes materials by recycling glass bottles, cardboard boxes and plastic is able to earn a living (see section 2.3.2).

There is an interaction between the site and government departments such as Education, Environmental Affairs and Tourism, Water Affairs and Forestry and Agriculture, Conservation and Environment. Abrahams and Corsane (2000: 16) and Knapp (2000: 36) support the idea of interaction between the heritage institutions and the Department of Education when they indicate that the heritage educators should be able to move heritage education (non-formal environmental education) from the margins to the mainstream (formal environmental education) (see section 2.3.3).

5.4.3 Data on heritage educators at the site

Only one person is responsible for offering formal educational activities as revealed by the results. She is called the education marketing officer, but the research calls her a heritage educator. In this regard, Abrahams and Corsane, (2000: 16) indicate that heritage educators have an opportunity of moving heritage education to the mainstream (see also section 2.3.3). The heritage educator knew through departmental workshops she attended when she was still a district facilitator that EE is a theme that is integrated within the main curriculum. Although the participant believes that it is important to receive training in both EE and the curriculum since all learning areas address environmental issues, she was only underwent training in the NCS. The problem of the heritage educator at Maropeng not being trained in EE is not an isolated case. Samuel (1993: 28) contends that the confusion experienced by teachers regarding the difference between outdoor education and environmental education, indicates that there is a need for teachers to receive training in EE (see section 1.4). Training in EE could enable the participants to teach environmental activities and use the available resources at the Cradle of Humankind.

The participant concurs with (Bopape 2006: 107) when she says that teachers should be developed professionally in terms of learning about different teaching methods, educational outings, environmental policies, environmental policies, environmental theory and content, and how to infuse them into all the NCS learning areas. Interaction with the Department of Education includes seeking approval at national, district and school levels for educational activities. (Knapp 2000: 36).

In section 2.3.3 it is proposed that to ensure successful implementation of EE, we must begin to find ways of combining formal EE efforts with those of non-formal EE. Interaction has been taking place with other provinces with the exception of Kwa-Zulu Natal and the Cape. Certain departments such as the Departments of Health, Sports and Recreation and Defence do visit the site to learn more about the history of the site.

5.4.4 Data on how to teach environmental activities at the site

The results indicate that learners are taught through practical activities, using a hands- on-approach. They are made to smell, touch and feel the objects under study such as grass, for instance. Samuel (1993: 28) alludes to the fact that teachers are confused regarding the difference between outdoor education and environmental education and therefore think that they are the same (see section 1.4). Powers (2004) in Bopape (2006: 102) cites that teachers cannot teach and learn EE without being outdoors since outdoor activities are resources that integrate EE in the courses taught. However, special arrangements should be made by teachers with the Maropeng education marketing officer if they want learners to be taught environmental activities. This is because the Cradle of Humankind should arrange with Mogale's environmental education centre in turn for such environmental activities. It simply means that the Cradle of Humankind does not offer environmental activities that aim to teach learners a sustainable way of using the natural resources.

The exploitation of resources has been shown to be a problem in Lesotho as stated in by Nthunya (2002: 71) when indicating that Lesotho has depleted its natural and historical heritage due to the unwise use and national management of resources (see section 2.3.4 (b)). This includes the depletion of fauna and flora, the vandalism of historical heritage, overstocking that leads to severe overgrazing, uncontrolled bush fires, while road construction also contributed to this state of affairs. This notion is also shared by Morris (2003: 200) concerning the people of Driekopseiland who abused the environment as well as by Palmer and Neal (1994: 172) in their definition of a heritage site (see section 2.3.2). All these reports are in line with the environmental issues that appear on the sustainability wall in the Maropeng exhibition hall and relate to a human negative impact on the environment.

5.4.5 Data on heritage, environmental activities and the curriculum

The research results reveal that heritage sites focus on conservation depending on the nature of the heritage. Mackeicher and Du Cross (2002: 7) urge that heritage sites should be conserved, protected or preserved since they provide some essential educational, historical, and economic information (see section 1.2). A lack of clarity by the participants regarding opportunities to integrate heritage issues with topics and learning areas in the curriculum, environmental activities and the curriculum and that some schools in Gauteng participate in the world Heritage Youth forum as evidenced by the research. This is contrary to the stance of the Department of Arts and Culture, (2002); the Department of Education (2003), Segobye (2005: 80); and UNESCO (2001) regarding integrating the above issues as discussed in section

2.3.2. The authors just mentioned are in agreement regarding the integration of heritage education, environmental education and the curriculum. Learners from Gauteng schools are expected to present topics that cover heritage issues. In September 2001 in particular, learners in the World Heritage Youth Forum had present talks on the fact that the first human being originated in Africa at the Cradle of Humankind, while other topics include environmental challenges and the conservation World Heritage (see section 2.3.2).

Bornman (1992: 166); Knapp (2000: 36) and Sitarz (1994: 93) agree that formal and non-formal education complement each other and therefore are both crucial to changing people's negative attitudes towards the environment (see section 2.3.2). Corsane (2005: 215) and Smith in Simelane (2006: 14) (see section 1.1). Abrahams and Corsane (2000: 16 & 23) made a similar observation regarding the importance of heritage sites as non-formal education resources (see section 2.3.2).

5.4.6 Data on resources for teaching environmental activities at the site

In section 1.2 it was indicated that heritage sites are regarded as EE resources. The research results reveal that there are other sub resources within the heritage site itself. At the Cradle of Humankind the sub-sources are: the teacher's resource pack, the Maropeng educational resource pack, the sustainability wall and recorded information accessed via telephones in the exhibition hall as evidenced by the research results. The two sub- resources, namely the teacher's resource pack and the sustainability wall were first outlined in section 2.3.4.

The teacher's resource pack provides information on the history of the site, the thousands of school children that visit Maropeng, the extinction of the dinosaurs and introductory information on the sustainability wall as in stated in section 2.3.4 (a). The research reveals that the Maropeng educational resource pack embodies the NCS principles; one of which is of interest to this study, namely social justice, healthy environment, human rights and inclusivity. The results further reveal that the respondents are aware of the contents of Bill of Rights regarding environment that is not harmful to the health of people. Information on the sustainability wall relates to the negative human impact on the environment, as evidenced by the research results. These include extinction, the four main elements forces, the incorrect dumping by officials from the health services biodiversity, various ways of creating environmentally friendly energy and deforestation. The results reveal that telephones in the exhibition hall have records covering environmental information on the extinction of the dodo.

New concepts that were grounded in the collected data emerged which include indigenous plants, partnership, pollution, recycling and the pom-pom weed, the alien plants that the Maropeng staff uprooted. Removing the alien plants and addressing pollution in heritage sites is limited to Maropeng, the Department of Arts and Culture (2006: 3-4) mentions their partnership with the Robben Island Museum to remove alien plants from and to address pollution on the island (see section 2.3.1)

5.4.7 Data on educators who visited the site

The data reveal that educators understand the concept 'EE' which also helps them to teach learners environmental activities on the fauna and the flora, the ecosystem and by cleaning campaigns and taking learners to wetlands. Educators were not trained in EE but learnt about the concept in different ways which include; workshops at environmental education centres, national botanical gardens, national geographic programme, from the NCS learning outcomes (LOs) and assessment standards (ASs) that focusses on environmental issues when planning, and during wetlands trips where tour guides present topics on environmental issues such as the ecosystem. The research results reveal that educators that responded to the sustainability wall read the information for themselves because they were interested in the information it contains. Results show that educators are informed about the history of the Cradle of Humankind, especially the origin of man (see section 2.1.6) when they visit the site, but not much is learnt about environmental issues. These results are unlike those contained in the Robben Island Museum Annual Report (2002-2003: 1) that shows involvement of the heritage site in environmental issues such as the recycling of empty cement bag papers and education that takes place inside the cells (see section 2.3.1).

5.4.8 Testing the hypothesis

The hypothesis in this study emanates from the problem statement that even though heritage sites are regarded as EE resources, they are not recognised as such yet. This calls for finding ways to ensure that they are recognised as EE resources, since the provision of adequate and appropriate EE resources is a problem that also hampers the successful implementation of EE.

The hypothesis is that world heritage sites will be successful with EE programmes and learners activities if:

5.4.8 (a) The education staff receives training regarding the requirements of the National Curriculum Statement.

5.4.8 (b) Learners' activities at the site are directed at addressing learning outcomes and assessment standards focussing on environmental issues.

5.4.8 (c) The education staff of heritage sites could liaise with the Department of Education.

Information was obtained by means of observations carried out during the presentations to teachers and learners by the tour guides and the education marketing officer. In addition, open ended interviews were conducted with the Cradle of Humankind management representative and the education marketing officer of the site. Further interviews were conducted with teachers who visited the site, in particular, the Maropeng site and the Sterkfontein Caves. It is essential that the education staff at the heritage should receive training regarding the National Curriculum Statement and the EE, so that learner's activities can be directed at addressing the learning outcomes and assessment standards that focus on environmental issues. However, there is ongoing interaction with the Department of Education that focusses more on obtaining approval of their CDS than on how can they work together to integrate EE with the NCS.

5.5 Recommendations

MacMillan and Schumacher (2001: 393) note that qualitative research contributes to educational practice and is important for the improvement of educational practice (see section 3.2). To improve the educational practice at the Cradle of Humankind, the researcher recommends that:

5.5.1 The heritage educator should receive training in EE as she has already been trained in the NCS. This would assist the heritage educator to implement EE effectively since EE should be integrated with the NCS in which she has already received training.

5.5.2 Training the tour guides in implementing the NCS and EE could be beneficial to the site because the education marketing officer does formal presentations alone, while on the other hand, learners and educators who visit the site could also benefit.

5.5.3. Learners' activities in the teacher's resource pack should also cover learning outcomes and assessment standards that address environmental issues that can also use the sustainability wall as a resource.

5.5.4 The Cradle of Humankind should develop an EE policy as a site that will assist them to integrate EE with the NCS in their particular context.

5.5.5 The site should not only interact with the Department of Education for approval and the distribution of CDS. They should extend their services by interacting with deputy chief education specialists and senior education specialists because these are the people who are responsible for the implementation of the NCS on a daily basis.

5.5.6 In an attempt to address environmental issues mentioned on the sustainability wall, the site should develop a worksheet that covers issues that appear on this wall for learners and teachers who visit site to complete.

5.5.7 The site should liaise with the World Heritage Youth Forum so that they can assist learners from our country to make better presentations about the site when they meet with other countries.

5.5.8 There are various institutions that offer courses for EE to those who are interested.

5.5.9 The researcher will give a copy of the research to the management of the Cradle of Humankind, Department of environment and tourism, and Department of Education.

5.6 Limitations of the study

The wish of the researcher was to include a large number of interviewees to enhance the quality of the results. However, it was realised by the researcher during the research process that there were some limiting aspects that were beyond her powers. The following were identified as aspects that could have created gaps in this study:

5.6.1 The researcher wished to include tour guides, tourists and a large number of the management at the site in the data collection process which would have enhanced the credibility and validity of the results

and recommendations. This was not possible due to time constraints on the side of the site managers and tour guides while permission was not granted to interview the tourists.

5.6.2 It is the researcher's opinion that if she had accessed the EE policy that was being discussed by the site that would have enhanced her understanding of the site's stance in terms of EE. However, this could not happen because the site was not yet ready to show it to the public.

5.6.3 It was the researcher's plan to conduct face-to-face interviews with all the educators who visited the Cradle of Humankind, but this was not possible because the Gauteng Provincial Department of Education could not respond to the researcher's request.

5.6.4 Telephonic interviews are expensive and the researcher could not afford to conduct long interviews due to financial constraints.

5.6.5 This is a case study and so the findings may not be universally applicable, but are only applicable to similar situations.

5.7 Suggestions for further research

Further research could be done on the possibility and logistics of implementing the recommendations made in this chapter. In addition, the impact that the implementation of the recommendations could have on learners and educators who visit the Cradle of Humankind should be researched.

5.8 Summary

Inadequate access to appropriate EE Learning Teaching Support Material (LTSM) is a widespread problem. The purpose of this study is to establish the role that world heritage sites can play to provide adequate access to appropriate EE resources. Results revealed that the educational staff of the site is not trained in EE, and that EE programmes and learners activities offered to teachers and learners who visit the site are not designed to address LOs and ASs that focuses on environmental issues. The study recommends that the education staff of the site be trained in EE and that the EE programmes and learners activities be designed to address LOs and ASs that focusing on environmental issues.

Bibliography

Abrahams, R & Corsane, G. 2000. Empowering South African heritage educators. *South African museums association bulletin* Vol. 25(1):16-29.

African National Congress, 1994. *The reconstruction and development programme: A policy framework.* Johannesburg: Umanyo.

Babier, ED. 1998. *The economics of the environment and development.* London: Edward Edgar.

Berg, LB. 1998. *Qualitative research methods for the social sciences*. London: Allyn and Bacon.

Bopape, J. 2005. *Professional Development of teachers for effective Environmental Education.* Pretoria: Unisa.

Bornman, E. 1991. *Man and environment.* Pretoria: Knowledge Tec.

Bornman, GM. 1997. Towards a model for the integration of Environment Education into the existing secondary school curriculum in South Africa. Pretoria:University of South Africa. (Unpublished DEd dissertation)'

Breedlove, G. 2002. A review of the proceedings of the Unesco forum -Universities and heritage. *South African Journal of Cultural History.Vol. 16(1):136-149.*

Brunton, C & Associates, 2003. *The Norms and Standards for educators 2000, A-59-88*. Education Labour Relations Council.

Chacko, CPC. 2000. The nature and measurement of environmental literacy for sustainability. Pretoria:Unisa. (Unpublished D.Ed thesis).

Corsane, G. 2005. *Heritage, Museums and Galleries: An Introductory Reader*. London: Routledge.

Clacherty, A. 1995. *Environmental education policy options for formal education in South Africa: A source document for curriculum development in environmental education*. Johannesburg: EEPI.

Creswell, JW. 2003. *Research design, qualitative, quantitative, and mixed methods pproaches.2dn ed.* London: Sage.

Department of Agriculture, Conservation and Environment. 2007. *Cradle of Humankind world heritage site and Dinokeng blue IQ projects*. Sunday Times: 19 August: 35.

Department of Arts & Culture. 2002. *Celebration of our heritage: History, values and creativity. Our roots are speaking*. Pretoria: Department of Arts & Culture.

Department of Arts & Culture. 2006. *Report on the progress made on the recommendations contained in the ICOMOS/IUCN/ICCROM inspection mission to the Robben Island world heritage site*. Pretoria: Department of Arts and Culture.

Department of Education. 1995. *Education & Training in a Democratic South Africa. White Paper on Education and Training.* Cape Town: Department of Education.

Department of Education. 1998. A programme for the transformation of further education and training, Education white paper 4. *Government Gazette vol.399, no. 19281*. Pretoria: Government Printers.

Department of Education. 2000. *Norms and Standards for Educators Policy.* Pretoria: Department of Education.

Department of Education. 2000. *The national curriculum framework for further education and training:* Pretoria: Department of Education.

Department of Education. 2001. *Manifesto on Values, Education, and Democracy*. Cape Town: Department Education.

Department of Education. 2002. Overview. Pretoria: Department of Education.

Department of Education. 2002. *National curriculum statement: Social sciences grades R-9.* (Schools) policy. Pretoria: Department of Education.

Department of Education, 2003. *The National Curriculum Statement*. Pretoria: Department of Education.

Department of Education. 2003. *National curriculum statement: History grades 10-12 (General).* Pretoria: Department of Education.

Department of Education. 2003. *National curriculum statement: Geography grades 10-12 (General).* Pretoria: Department of Education.

Department of Education. 2003. *National curriculum statement: Accounting Grades 10-12 (General).* Pretoria: Department of education.

Department of Environmental Affairs & Tourism. 1996. An Environmental Policy for South Africa. Pretoria:Department of Environmental Affairs of Tourism.

Department of Environmental Affairs & Development Planning, 1998. *The National Environmental Management Act 107.* Pretoria: Department of Environmental Affairs and Development Planning.

Department of Environmental Affairs & Tourism, 1998. White Paper on Environmental Management Policy for South Africa. *Government Gazette,* vol.395, no. 18894

Department of Environmental Affairs & Tourism, 1998. White paper on environmental policy for South Africa. *Government Gazette, vol.*395, no. 18894.

De Vaus, D. 2001. Research design in social research. London: SAGE.

Donaldson, R. & Williams, A. 2005. *A Struggle of an Inner City Community to Protect its Historical Environment: The Case of Clydesdale in Pretoria*. New centre no.49:165-180.

Enomoto, EK. & Bair, MA. 2002. *The role of the school in the assimilation of immigrant children: A case study of Arab-Americans.* San Fracisco: Jossey-Bass.

Exposing learners to environmental issues, 2007. no page. *A third green flag for Monde primary, one of 700 Eco-schools in the country*. Sowetan: 10 September: School matters.

Flick, U. 2006. Third edition, An introduction to qualitative research. London:SAGE

Frohlich, G. 2004. *Towards supporting tutoring in a semi-distance Environmental Education course*: *A Namibian case study*. Pretoria: University of South Africa (unpublished Med dissertation).

Gauteng Provincial Government. s.a. *What makes the Cradle of Humankind of unique scientific value?* Gauteng provincial government.

Goodwin, CL. 2007. *The provision of environmental education towards sustainability with reference to the inner city environ centre in Tshwane*. Pretoria: Unisa.

Gray, DE. 2004. *Doing research in the real world.* London: SAGE.

Hatton D & Powell M, s.a. President's Report (for the period ended 1996). *African Wildlife*, vol.51 (1):32-38.

Hyber, T. & Bennet, J. 2002. *Environmental management and the competitiveness of nature: Based tourism destinations.* : Cheltenam: Edward Elgar.

International Council on Monuments and Sites, 2005. *Background paper, special expert meeting of the world heritage convention: The concept of outstanding universal value.* Kazan: Republic of Tartarstan Russian federation.

Jones, SR. 2002. *Becoming grounded in grounded theory methodology*. San Fracisco: Jossey-Bass.

Keser, OF: Ozman, H and Akdeniz, F. 2002. *Energy, environment and relationship in developing countries policies: Case study for turkey.* Turkey: Karadeniz technical University.

Kobola, MW. 2007. The role of the school principal in the implementation of the revised national curriculum statement: a case study.

Knapp, D. 2000. The Thessaloniki declaration: A wake up call for environmental education. *The Journal of Environmental Education.* Vol. 31(3):32-39.

Kros, C. 2006. *Report on national heritage workshop held at the constitution hill*. 24 May 2006.

Loubser, CP. 1997. Cross curricular teaching: an approach in the new South African School curriculum. *Educare*, 26 (1& 2): 25-34.

Mackeicher, B and Du Cross, H. 2002. *The partnership between Tourism and Cultural Heritage Management*. Binghamton:Harthworth Press.

McMillan, JH. & Schumacher, S. 2001. *Research in education: A conceptual introduction (5th ed).* New York:Longman.

Maila, MW. 2003. *Issues and challenges regarding the implementation of Environmental Education policy in formal education in South Africa*. Pretoria:Unisa.

Maropeng, 2006a. *Maropeng educational resource pack.* s.a.

Maropeng, 2006b. *Sustainability wall*. Maropeng.

Maropeng, 2006c. *Teacher's resource pack.* s.a.

Marshall, C & Rossman, GB. 2006. Fourth edition, Dsigning qualitative research. London: SAGE.

Mason, J. 2002. Second edition, Qualitative research.. London: Sage publication

Masuku-van Damme, L. 2002. *Ecological diversity/ Indigeneous knowledge/ Environmental Education in*

The Long Walk To sustainability: A Southern African perspective in World summit publication. (2002):32-35. Johannesburg.

Merriam, SB. 2002. *Qualitative research in practice: Examples for discussions and analysis*. San Fracisco: Jossey-Bass.

Morris, D. 2003. Rock art as source and resource: Research and responsibility towards education, heritage, and tourism. *South African Historical Journal. Vol 49: 192-206.*

Mouton, J. 2001. *How to succeed in your Masters and Doctoral Studies*. A South African Guide. Pretoria: Van Schaik.

Mudzunga, HD. 2006. The role of Schoemansdal Environmental Education centre in the development of Environmental Education in its neighbouring schools. Pretoria: University of South Africa. (Unpublished Med dissertation).

Nahunta, E. 2002. Environmental issues in the education system of Lesotho. *Convergence: Proquest Education Journals,* vol.xxxv, 35(4):71-80.

National heritage council Act 11 of 1999. *Government Gazette vol.406, no. 19961*. Cape Town.

National Heritage Council Act 11 of 1999. *Cultural laws second amendment Act 69 0f 2001: Regulations relating to appointment of members of council Act.*

National heritage resources Act 25 of 1999. Pretoria: Juta & company.

NEEP-GET, 2004. *Lesson planning for a healthy environment: Teachers working with the national curriculum statement* (R-9). Howick: Sharenet.

Neuman, WL. 1997. *Social research methods: Qualitative and quantitative*.Third Edition. London: Allyn and Bacon.

Nieuwlands, H. 2006. Sustainability and internal auditing. Altamonte Springs, Fla: Institute of internal auditors. IIAResearch foundation.

Orbasli, A. 2000. *Tourism in Historic Towns.* Urban conservation and Heritage Management. London and New York: E & FN SPON.

Ouzman, S. 2004. Another world: *Ethics and Archaeology in the Modern World*. Vol,21(1):14-15

Page, GT., Thomas, JB, & Marshall, AR. 1977. *International dictionary of education*. New York: Kogan page, London/ Nichols.

Palmer, J & Neal, P. 1994. *The Handbook of Environmental Education*. London: Routledge.

Places South Africa. 1997-2005. *The Cradle of Humankind*. Paarl, Western Cape.

Petzet, M. 2005. *World cultural heritage: Defining the outstanding universal value.* Paris: n.p.

Pitamber, P. 2007. *We are all guilty of forgetting about rubbish once it is in the bin. As South Africans, we rarely think of recycling anything: Turning waste into wealth.* City press: 17 June: 30.

Rainbird educational cc. s.a. *South Africa's world heritage: Robben Island.* Johannesburg: Rainbird educational cc.

Rainbird, educational cc. s.a. *South Africa's world heritage site: Cape flora region.* Johannesburg: Rainbird educational cc.

Rainbird educational cc. s.a. *South Africa's world heritage site: Cradle of humankind.* Johanneburg: Rainbird educational cc.

Rainbird Educational cc, s.a. *The Cradle of Humankind.* Johannesburg: Rainbird Educational cc.

Rainbird educational cc. s.a. *South Africa's world heritage site*: *Greater st. Lucia Wetland Park.* Johanneburg: Rainbird educational cc.

Rainbird educational cc. s.a. *South Africa's world heritage: Mapungubwe.* Johannesburg: Rainbird educational cc.

Rainbird educational cc. s.a. *South Africa's world heritage: uKhahlamba Drakensberg Park.* Johannesburg: Rainbird educational cc.

Rainbird educational cc. s.a. *South Africa's world heritage: Vredefort Dome*. Johannesburg: Rainbird educational cc.

Robben Island Museum Annual Report. 2002- 2004. *Vision, Mission and Principles*. Cape Town: Robben Island Museum.

Samuel, H. 1993. Impedements to Implementing Environmental Education. *Journal of Environmental Education* vol. 25, (1):26-29.

Segobye, AK. 2005. Weaving fragments of the past for a united Africa: Reflections on the place of African archaeology in the development of the continent in the 21st century. *South African Archaeological Bulletin* 60 (182):79- 83.

Simelane, DZ. 2006. *Community Responses to environmental education Initiative*. Pretoria: Unisa.

Sinclare, P. 1996. The cultural environment: heritage conservation. *EE Bulletin 12(May 1996).*

Sindane, L. 2003. *Human History on display*. Johannesburg: Sindane.

Sitarz, D. 1994. *The Earth summit Strategy To Save Our Planet*. Colorado: Boulder.

Soanes, C. 2002. *Oxford English Dictionary:* New York: Oxford University press.

South African heritage resources agency, 1999.

South African heritage resources Act of 1999.

Taylor, N. & Vinjevold, P. (eds.). 1999. *Getting learning right: Report of the president's education initiative research project.* Johannesburg: Joint education trust.

Taylor, J & Russo, V. 2002. *The SADC Regional Environmental Education Programme, in The Long Walk To Sustainability: A South African Perspective*, :36-39.

The constitutional Court Library and Website: Constitution of South Africa, 2005. Including the constitution Twelfth amended Act, 2005. Pretoria: Government Printers.

The Long Walk To Sustainability: A South African Perspective, 2002. Johannesburg: World Summit Publication.

Thomas, RJ & Nelson, JK. 1990. *Research Methods in Physical Activity*. Second edition. Human Kinetic.

Tlhabanel, BB.2004. Factors impeding the integration of environmental education into learning areas in grades 8 & 9: A case study. Pretoria: Unisa (Unpublished Med dissertation).

Tselane, T. & Mosidi, S. 1998. *Integration of environmental education in out-comes-based education: Exemplars of learning programmes using the phases organiser " environment" as developed by Northern Cape teachers.* Pretoria: Department of environmental affairs and tourism.

Tswaing. 2005.Tswaing Meteorite Crater: Environmental Education Programme. Tswaing.

Unsco-Unep, 1987. *Congress and Training: International Strategy for Action in the field of Environmental Education and Training for the 1990s*. Unesco.

Unesco, 1985. *Interdisciplinary Approaches in Environmental Education Programme. Environmental Education series 14.* Unesco Division of Science, Technical and Environmental Education. Unesco.

Unesco-Unep, 1977. *The Tbilisi Declaration: Intergovernmental Conference on Environmental Education*. October 14-26, Unesco.

Unesco, 1990. *World heritage list.* Paris*:* Unesco.

Unesco, 2001a. Invitation to World Heritage Youth Forum Kalskrona. *Young peoples participation in world heritage education Swedish national commission for Unesco.* Pretoria: South African National Commission for Unesco.

Unesco, 2001b. *Convention concerning the protection of the world cultural and natural heritage: Bureau of the world heritage committee. Report of the rapporteur.* Paris: Unesco.

Unesco, 2001c. Background to the World Heritage Youth Forum. Paris: *Unesco.*

Unesco, 2005. *Call for papers: International forum transmitting intangible cultural heritage: Youth, education, and development.* Latvia: Latvian national commission for Unesco.

Unesco, 2006. The intangible heritage messenger. Paris: Unesco.

Vogt, A. 2001. *Fruhneuzeitliche handelsfestungen an den kusten afrikans heute- die sicht der denkmalpflege.* Namibia: Windhoek. 49(issn: 1018-7677) 51-90.

Wagiet, R 2002. *Environmental Adviser to the National Minister of Education, Department, in The Long Walk to Sustainability: A South African Perspective.* Johannesburg: World Summit Publication.

APPENDIX A

PROPOSED QUESTIONS FOR INTERVIEWS AND QUESTIONNAIRE

SECTION A

1 Biographical data of participants

1.1 What is your gender?	F		M	
1.2 What is your teaching experience?	0-10	10-20	20-30	30-40
1.3 What is your portfolio/position?	Teacher	HOD	Deputy Principal	Principal
1.4 What professional training did you receive?	Diploma	PTC	HED	B A Paed iv
1.5 What are your qualifications?	Degree	Honours	Masters	PHD
1.6 Did you receive training in EE?	Yes		No	
1.7 Were you trained in the National Curriculum Statement?	Yes		No	

SECTION B

1 Data on Environmental Education policies (directed at managers)

1.1 What environmental education policies do you know?

1.2 What do the Cradle of Humankind policies say about environmental education at this site?

1.3 Why do you think it is important to have environmental education policies at the Cradle of Humankind?

1.4 How would you link environmental education policies and government departments such as:

1.4.1 Department of Education

1.4.2 Department of Environmental Affairs and Tourism

1.4.3 Water Affairs and Forestry

1.5 What is the link between environmental education and non-governmental organizations (environmental education centers, heritage sites, etc?

2 Data on heritage educators at the site

2.1 Do you know the concept environmental education? | YES | | NO | |

2.2 If yes, what is your understanding of the concept?

2.3 How did you find out about the concept environmental education?

2.4 Do you think is important that you are trained in both environmental education and the National Curriculum Statement?

Yes		No	

2.5 If yes, explain why.

2.6 Do you interact with the Department of Education?

Yes		No	

2.7 If yes, how?

2.8 Why would you think is important that you interact with the Department of Education?

3 **Data on teaching environmental education at the site**

3.1 How do you employ 'hands on method' when you teach environmental education at the Cradle of Humankind?

3.2 What is your target group?

3.3 What environmental education knowledge can the target group gain when visiting the site?

3.4 Why do you teach environmental education at this site?

3.5 How do you interact with the following when you teach environmental education:

3.5.1 Environmental education clubs,

3.5.2 Environmental education centres, and

3.5.3 Environmental education associations?

4 Heritage issues, environmental education and the curriculum data

4.1 How would you link the curriculum, heritage sites and environmental education when you teach?

4.2 What opportunities are in place in the curriculum to link the above?

4.3 Why is it important to link them?

4.4 What do you know about World Heritage Youth Forums?

4.5 Why it is important that you interact with people who organise such forums?

5 Data on environmental education at the Cradle of Humankind

5.1 What do you understand by the concept 'hands-on method' in teaching environmental education?

5.1 What resources do you use to teach environmental education at the site?

5.2 What is the role of the sustainability wall with regard to teaching environmental education at the Cradle of Humankind?

5.3 How did people who lived in the Cradle of Humankind interact with the environment in terms of the following?

5.3.1 Water

5.3.2 Soil

5.3.3 Animals

5.3.4 Veld foods

5.3.5 Trees

5.3.6 Pasturage

6 Data on educators visiting the site

6.1 What do you understand about the concept environmental education?

6.2 How did you find out about the concept environmental education?

6.3 What knowledge do you gain in terms of environmental education when you visit the site?

6.4 How do you teach EE at school?

6.5 How is your visit to the Cradle of Humankind assisting you in linking environmental education and the curriculum?

6.6 What any more information about environmental education have you gained by visiting the site?

6.7 Why do you think is important to set environmental questions for learners when they visit the site?

6.8 What do you understand about the sustainability wall?

6.9 How do you link environmental education resources with the Cradle of Humankind?

APPENDIX B

UNISA

TO WHOM IT MAY CONCERN

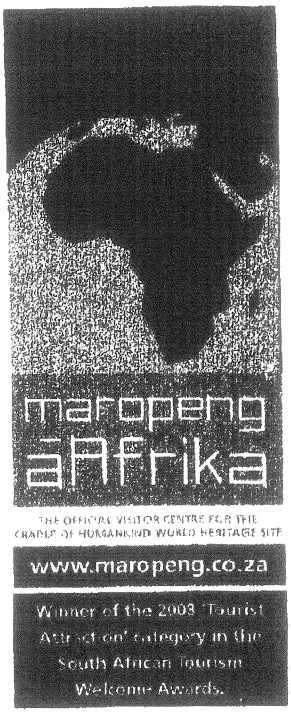
Dear Sir/madam

This is to state that Mrs MV Makokotlela, st nr 7280033 is registered for the Med (Environmental education) at the University of South Africa and that she needs to conduct interviews with staff at the Cradle of Humankind and 15 schools in the Tshwane South district.

Yours sincerely

Prof CP Loubser
Supervisor

APPENDIX C



26th January 2009

To whom it my concern

RE: Mrs. M V Makokotlela

Mrs. Makokotlela had requested permission to visit and conduct interviews with the staff

At the World Heritage Site: Maropeng.

We have supported her in the achievement of her goals. We have allowed her to visit and pose questions referring to her studies.

We wishes her all the best in her studies further.

Kind Regards

Magel van de Venter

Educational Marketing Executive

082 371 6521

Maropeng a' Afrika Leisure (Pty) Ltd, Reg. No. 2002/032101/07

R400 (just off the R563 Hekpoort), Cradle of Humankind, South Africa
PO Box 1426, Rant en Dal, 1751, South Africa
Tel: +27 (0) 14 577 9000, Fax: +27 (0) 14 577 9500, www.maropeng.co.za

APPENDIX D

[redacted]

Register for Winnie Alexander Natural Science Delegation

Date: 28th January 2009

Meeting: Maropeng

Contact person: Winnie Alexander

Name & Surname	Designation: Work description	District	Telephone	Email address	Signature: Received Disk
1. AMANDA MUSHI	EDUCATOR	JHB CENT.	011 984 4454		[illegible]
2. Ishidi lekane	H.O.D	"	011 982-1137		[illegible]
3. Mpho Mabira	HOD	JHB CENT.	011 986-3387		[illegible]
4. Susan Simons	Educator	D14	011-9453214		[illegible]
5. Abraham Mokoena	HOD	D14	" "		[illegible]
6. NOMSA HLONGWANE	EDUCATOR	D14	011 930 5111		[illegible]
7. Xulu Rebecca	EDUCATOR	D14	(011) 984-4246		[illegible]
8. MAHLANGU S.P	EDUCATOR	D14	(011) 934-8002		[illegible]
9. MOHLABI M.A	HOD	D14	(011) 984-4246		[illegible]
10. Makhuvele E.	Educator	D14	(011) 9453615		[illegible]
11. SAM [illegible]	H.O.D	D14	(011) 9444407		[illegible]
12. ZAMEKA MKETSHANE	EDUCATOR	D14	(011) 984.4407.		[illegible]
13. P.N. TLHAOE	Educator	D14	(011) 945-3615	tlholoepn@gmail.com	[illegible]
14. Martin van Rooyen	Educator	D14	~~(011)~~ 0127254427		[illegible]
15. Charlotte Kunene	Educator	JHB Central	011 984-4276		[illegible]
16. PRISCILLA DLAMINI	HOD	D 14	011 984 4247		[illegible]
17. THOKO P. DENGA	EDUCATOR	D14	(011) 931-2956		[illegible]
18. Orita Zukalale	EDUCATOR	D 14	(011) 931-2956		[illegible]
19. Sipho Mzangue	Deputy Principal	D14	(011) 945-2811		[illegible]
20. Grace Lebjane	Educator	D14	(011) 945-2811		[illegible]

Name & Surname	Designation	School or Region	Telephone	Email address	Signature: Received Disk
21 DINA MAFA	EDUCATOR	D14 (BAFIKILE)			[illegible]
22 Cecil Christina	DEPUTY	JHB Central	011 945-3615		[illegible]
23 Dupa Mothabane	EDUCATOR	D14 (JHB CENTRAL)	(011) 931-2527		[illegible]
24. Mandlakayise Buthelezi	"	" Isu'Lihle	011 934 8002		[illegible]
25 Dupa Thunyane	HOD	D14	0835837474		[illegible]
26 Siza Kheswa	EDUCATOR	ISAACSON PR. D14	011 986 6241		[illegible]
27. MALANGE MBULU	HOD	HITEKANI P/S	011 984-3171	mbulungeni@webmail.co.za	[illegible]
28. NKUNA IRENE	EDUCATOR	NHLUVUKO P.	011 984 4418		[illegible]
29. JOYCE SAMBO	EDUCATOR	HITEKANI P/S.	011 984-3171		[illegible]
30. JOANA MOLULI	EDUC	SIYAVUMA P. SCHOOL	(011) 932 7871		[illegible]
31. Wendy Phora	EDUCATOR	Matholong	(011) 930-2714		[illegible]
32. ~~MATAULA~~					
33. P.M. MTHMANE	EDUCATOR	ISU'LIHLE	011 934 8002		[illegible]
34. Kuny Ramsey	Facilitator	JHB Central	011 9832161	Kumitree.Ramsaney	[illegible]
35. Simons	EDUCATOR	D14	011 945 3214	mokoena.abraham@yahoo.com	[illegible]
36. Abraham	EDUCATOR	D14	011 945 3214	mokoena.abraham@yahoo.com	[illegible]
37. TUGE	EDUCATOR	D14 Rutegang P.	011 9825279	N/A	[illegible]
38. Nhlapo	EDUCATOR	D14 Rutegang	011 9825279	N/A	Z.M. Nhlapo
39. Jalezwa Makendi	Principal	D14 Fundani	011 934 1105		[illegible]
40. Priscilla Dlamini	HOD	D14 VUKANI	011 984 4247	N/-	[illegible]

Name & Surname	Designation	School or Region	Telephone	Email address	Signature
41. Melisizwe Khoza	Educator	Isu'lihle	0119348002		
42. Ben Phogotiane	Educator	Isaacson P/S	011 986 6241		
43. Msimango AM	Educator	Khuthalani	011 931 2527		
44. Thembi	Facilitator	D14 SHB	84 983 2124		
45. Matlala Makgotiela	SES	D4	012 400 4910	khotso@dbe.gov.za	Researcher; to observe the presentation
46.					
47.					
48.					
49.					
50.					
51.					
52.					
53.					
54.					
55.					
56.					
57.					
58.					
59.					
60.					