

AN INVESTIGATION INTO THE USE OF
A NATURE RESERVE AS A CROSS-CURRICULAR
TEACHING RESOURCE

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by
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ABSTRACT

This study documents the development of the Queenstown nature reserve as a cross-curricular teaching resource. Participants in the project included the researcher, the municipality nature conservation officer and the senior Geography and Biology teachers from five high schools in the town. A modified action research approach was adopted. Data was collected from workshops and interviews and then analyzed. The conclusion of the research was that the participants perceived that the project had been worthwhile and was to be continued. The nature reserve is now more widely and usefully used.

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CHAPTER 1

INTRODUCTION

South Africans are increasingly concerned about the numerous and complex environmental problems in our country. Cock and Koch (1991) draw attention to the complexities of these problems by emphasizing that South Africa is faced with First World as well as Third World environmental problems.

It is widely accepted by environmental educators that if something is to be done about global and local environmental issues one of the priorities that has to be addressed is that of education (Irwin 1991, O'Donoghue 1993). The hope expressed by many environmental educationists (Irwin 1991, Fien 1993a, 1993b, O'Donoghue 1991, 1993, Huckle 1994) is that through education our society will be in a position not only to explore the environment and understand it better, but also to become pro-active in order to create a healthy environment where all people can enjoy a reasonable quality of life. One current approach to achieving this goal is posited as 'education **for** the environment', which seeks to engage participants "in the active resolution of environmental questions, issues and problems" (Fien 1993a:5).

A view widely held is that one of the best ways to approach environmental education is to make use of the local environment (Nightingale 1977, UNESCO-UNEP 1986, Gamble 1988, Hale 1986, Adonis 1993, O'Donoghue 1993, EEPI 1993, 1994).

South African towns often have a wide variety of environmental resources suitable for education purposes relatively close to the town. One such town is Queenstown, in the Eastern Cape, which has a nature reserve adjacent to it. The Lawrence de Lange Nature Reserve is northwest of the town against Madeira mountain and was proclaimed in 1982. The altitude of this reserve ranges from 1066m to 1608m. Longhill Nature Reserve

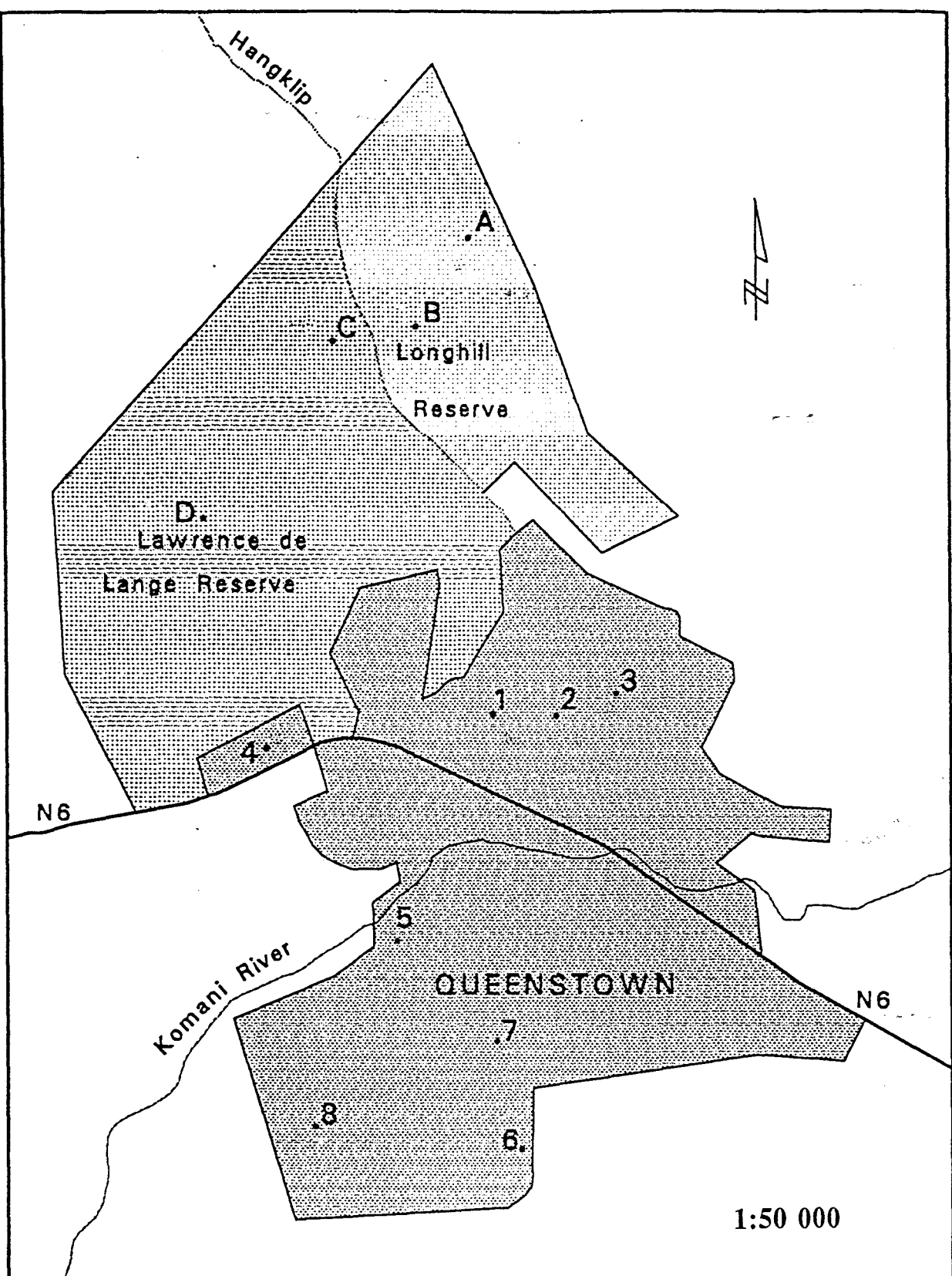


Figure 1.1 Study area locality map (excluding eZabeleni)

Schools that participated

1. Hoërskool Hangklip
2. Queen's College Senior
3. Girls High School
4. Hoërskool J J Serfontein
5. Kwa Komani High School

Sites in the Reserve

- A. Waterkloof
- B. Sunnyside
- C. Reserve office
- D. Tiffin kloof

Other schools

6. Hoërskool Maria Louw
7. Ncwankwa High School
8. John Noah High School

is virtually an extension of the Lawrence de Lange Nature Reserve and lies to the east across the Hangklip Road (See Figure 1.1). The Lawrence de Lange and Longhill nature reserves cover an area of approximately 1600 hectares.

In the reserves the dominant veld type is dry *Cympogon-Themeda* with invasion by *Acacia karroo* (Acocks 1975). Lubke, Tinely and Cowling (1988) classified this area as Highland sweet grassveld and Upland *Acacia* savanna. The grassveld is extensively invaded by *Acacia karroo* mainly due to mismanagement in the past. White rhino (*Ceratotherium simum*), giraffe (*Giraffa camelopardalis*), zebra (*Equus burchellii*) and thirteen antelope species are found in the reserves. The reserves are of ecological importance as they play a role in the conservation of the Eastern Cape cycad (*Encephalartos friderici-guilielmi*) and the endemic tamboekiethorn (*Erythrina acanthocarpa*).

The reserves are also of recreational importance and have various game drives and picnic sites. The reserves are open daily and entry to them is free. These reserves are administered by the Queenstown municipality. Management of the reserves is the task of the nature conservation officer assisted by the Lawrence de Lange nature reserve advisory committee whose members are game farmers of the area. These nature reserves are within 10km travelling distance of all schools in town. For the purpose of the research the term 'nature reserve' is used to refer to both the Lawrence de Lange and Longhill nature reserves.

Nature reserves are biophysical resources, which are widely regarded as one of the important dimensions of the environment (O'Donoghue 1991, 1993, Fien 1993b, Paxton 1994, EEPI 1994). It is my opinion that where the local environment includes a nature reserve it could be developed *inter alia* as a teaching resource. Having been involved with the local nature reserve for a number of years, I saw the potential and value of this

reserve. I was also aware that other teachers were working in the nature reserve but as these teachers were working on their own, no collaborative work was taking place. As one of the M.Ed degree requirements is to do research, it seemed worthwhile to address a practical issue such as developing the nature reserve as a cross-curricular teaching resource.

The overall goal of the research was to initiate a cross-curricular investigation through the perspectives of Geography and Biology into the optimal use of a nature reserve as an ecological resource for the development of "education for the environment" (Fien 1993a). An aim within this goal was for this research project to bring the teachers of the town together as there is very little contact among the schools in town (refer sections 5.3.7 and 6.1.1). A possible further aim would be to look at the educational potential of the rest of the Queenstown area (refer section 6.2).

As I wanted the development to be a communal project the nature conservation officer and teachers from six high schools were invited to participate in the study. The schools that were invited, together with their controlling authorities in 1994 were: Hoërskool Hangklip, an Afrikaans medium co-ed school (Cape Education Department); Hoërskool J.J. Serfontein a dual medium child care boys' school (Department of Education and Culture); Hoërskool Maria Louw, an Afrikaans medium co-ed school (House of Representatives); Queen's College, an English medium boys' school (Cape Education Department); Girls' High School, an English medium girls' school (Cape Education Department) and Kwa Komani, an English medium co-ed school (Department of Education and Training). The controlling authorities have since merged into one department, the Department of Education, Culture and Sport (Province of the Eastern Cape). Not all the senior schools in the area were involved as full representation was not sought but rather an effective working team (refer section 3.2). The location of these schools, as well as the high schools in Queenstown that

were not included, is shown on Figure 1.1. The nearby town of eZibeleni was excluded as the scale of the research needed to be contained. As I felt that direct comparisons amongst the schools that participated in the research was not fair to them or the teachers involved, the schools and the teachers are referred to by code letter so as to preserve some anonymity (refer table 3.1). Initially thirteen teachers indicated that they wanted to participate in the project.

As I wanted to develop the nature reserve as a cross-curricular teaching resource an assumption was that teaching in the reserve would be considered a worthwhile activity by the other teachers in town (refer sections 5.3.8, 5.3.9, 6.1.1 and 6.2). A further assumption was that the senior Geography and Biology teachers of the participating schools would involve other subject teachers at their respective schools (refer sections 6.1.1 and 6.2). The assumption was also made that, as the teachers who participated in the project had been living in Queenstown for a minimum of 8 years, they would know the area well (refer section 5.3.3 and 6.2).

Originally it was intended that the research would be based on an action research model and that it would be undertaken in several stages (refer section 3.1). These stages were to include focus groups, workshops and interviews that would be formatively evaluated by the research participants and the researcher.

As I was to be involved as a participant in the research some relevant background about myself is included. At the time of research I had been resident in Queenstown for ten years and had been involved with the reserve for six years. I teach Geography at Hoërskool Hangklip and my Std 9 Geography class do practical projects in the reserve each year. Some of these projects have been entered in the Department of Agriculture's annual resource conservation competition and have been the regional winners for the past four years and the national

winners for two consecutive years. I am also in charge of the school's environment club whose members often take part in activities in the reserve. While studying for a National Diploma in Nature Conservation through Technikon SA most of my practical projects were done in the nature reserve.

In chapter 2 I review related programmes and relevant literature on developing a nature reserve as a teaching resource. The methodology that was followed in this study is described and substantiated in chapter 3, including the reasons for choosing action research as an approach. Chapters 4 deals with the early stages of collecting data and chapter 5 on the final data collecting stages. In chapter 5 the research participants analyze and evaluate the whole process of developing a local nature reserve as a cross-curricular teaching resource. In chapter 6 I, as the researcher, evaluate the study and draw the work to a conclusion.

CHAPTER 2

A REVIEW OF RELATED PROGRAMMES AND RELEVANT LITERATURE

In this chapter a study is made of related programmes in Southern Africa and the literature that is relevant to the project. The following fields identified are:

- 2.1 The educational potential of the local environment
- 2.2 Nature reserves as centres for education in South Africa
- 2.3 The Queenstown nature reserves
- 2.4 School subjects and environmental education

2.1 THE EDUCATIONAL POTENTIAL OF THE LOCAL ENVIRONMENT

It is a widely held view that 'the local environment', whether it is in an urban or rural area, has the potential for use as an educational resource (Nightingale 1977, Hale 1986, UNESCO-UNEP 1986, Gamble 1988, Curror 1990, Adonis 1993, O'Donoghue 1993).

Gamble (1988:26) argues that

In all environments there is an almost infinite number of educationally valuable resources which are available at little or no cost, but which must be recognised in order to be optimised.

Among the arguments given as to why the local environment should be used are: resources are available at little cost, teachers could take the children out without disrupting the timetable, arrangements are more flexible as the teacher can re-schedule if it rains, long-term experiments could be undertaken and that children relate to their own familiar environment more readily. It was noted by O'Donoghue (1993:36) that the emphasis on the local environment is related to the intention "to foster an agenda of locally relevant issues and actions".

The local environment is not well utilized in South Africa. Nightingale (1977) found that teachers in the former South-

western Cape were not utilizing the area fully while Adonis (1993) came to the same conclusion about the Transkei region.

2.2 NATURE RESERVES AS CENTRES FOR EDUCATION IN SOUTH AFRICA

There are now wide-spread views that nature reserves should contribute towards the social and economic development and upliftment of people in South Africa (Cock and Koch 1991, Kantey 1992). Education would play a vital role in this.

The multiple use of the environment is advocated in a Government Gazette notice (RSA 1993) which classifies the terrestrial and marine protected areas of South Africa. In the introduction it is written that:

The development of nature conservation and specifically the establishment and management of protected areas have moved away from the traditional concept that all protected areas are to be preserved as sacrosanct wildlife sanctuaries. The accommodation of the lifestyles, aspirations and needs of local communities as part of the overall conservation ethic has become a globally accepted principle. (RSA 1993:79)

Organisations such as the Wildlife Society of Southern Africa (Giliomee 1989) and WWF(SA) (Booyens 1992), realize that a new conservation ethic has to be developed where conservation areas are relevant and accessible to all South Africans. New approaches and methods of managing game reserves are now being implemented in South Africa (Cooper 1991, Fig 1991, Ledger 1991, Munnik 1993, Van der Walt 1993).

Although environmental education is taking place in reserves such as Cape Point, Thomas Baines, De Hoop and Golden Gate there is no literature available on the education work being done. Most literature pertains to the former Bophuthatswana National Parks (Irwin 1987, 1993, Collinson 1992, Davies *et al* 1992, Ntsime 1992, Shongwe & Rammutla 1993), now the North West Conservation Agency, and the Umgeni Valley project which was initiated by the Wildlife Society of Southern Africa (Wright 1988). Other conservation bodies/agencies are not publishing with the result that the teaching community is not

benefitting from the environmental education work done in parks and reserves.

In the former Bophuthatswana the co-operation between the Bophuthatswana National Parks Board, the Department of Education and the University produced a network of environmental education activities that covered the whole territory of Bophuthatswana (Ntsime 1992, Shongwe & Rammutla 1993). One of the primary reasons for establishing the Pilansberg National Park in 1979 was that it should be used for educational purposes (Irwin 1987, Shongwe & Rammutla 1993). The Gold Fields Environmental Education Centre was established in the park and is extensively used by school pupils, teachers, college and university students. The Bophuthatswana National Parks Board established different programmes to facilitate education. *Community Upliftment Through Education (CUE)* was a joint project between the Environmental Education Initiative (EE) of Bophuthatswana Parks and the *Primary Education Upgrading Programme (PEUP)* of the Department of Education aimed at improving teachers education skills in the Pilansberg National Park. The Bophuthatswana Parks Board have also initiated a Tertiary Unit to enhance the teaching skills of lecturers.

Both the Bophuthatswana and Umgeni projects have succeeded as a result of dedicated people who took the initiative and established viable projects. These projects now have financial backing, the expertise of a well established parks board in the region that they can draw on and they make use of full-time trained staff members.

In Queenstown the development of the nature reserve would have to be done by the teachers, who had little or no expertise in environmental projects and cross-curricular work. The only conservation authority would be the nature conservation officer and there would be no funds available.

The National Parks Board (National Parks Board 1986) and Cape Nature Conservation (Hey 1992) do see a role for education in their reserves but still emphasise the conservation aspect of the reserves.

Only three sources of literature were found on education work done in local or municipal nature reserves.

Cottrell (1977) assessed the value of the Palmiet Nature Reserve, which is a small nature reserve in Westville, Natal. He found that there was a need for natural areas in towns for educational purposes for two distinct groups of people, namely the general public and educational institutions. A survey which was conducted in the Palmiet Nature Reserve indicated that 59% of the general public visited the reserve for recreational purposes. Cottrell felt that there is a need to educate the recreational user in an effort to bridge the gap which exists between preservation and the short term interest of recreational exploitation. A survey of the schools within a 3 km radius of the Palmiet Nature Reserve showed that poor use was made of this reserve for educational purposes. Although he suggests ways the educational needs of the recreationalist can be met, he does not suggest ways in which the reserve can be developed to be utilized by school groups.

Morty (1993) looked at how Queen Elizabeth park near Pietermaritzburg was developed into an environmental education resource centre. This park accommodates the Head Office of the Natal Parks Board. After consulting teachers it was agreed that they needed a properly equipped resource centre, a viewing hide at the rhino enclosure, redesigned trails and a printed teachers' guide to the reserve. This project however had substantial financial backing (R55 000). The article does not however go into details of how this resource was developed for teaching purposes.

Issac (1986), the education officer for the Border Branch of the Wildlife Society, looked at the educational use of nature reserves in the East London area. She found that the variety

of environment types in the area offered great scope for education using a multi-disciplinary approach. Different areas could be used, each with a different focal point which is determined by the particular area being visited. The identification of what aspects could be taught depended on what the education officer sees as being relevant.

2.3 THE QUEENSTOWN NATURE RESERVES

Literature available on the Queenstown nature reserves is in the form of municipal documents, management plans for the reserve and letters to the press. In a letter to the press a member of Queenstown's local game reserve advisory committee brings to the attention of the readers that conservation also means the utilization of our natural resources, which is taking place in the local game reserve to the extent that it is self supporting and that

with the advent of the new South Africa we [local game reserve] will have to prove to the people that our reserve is an asset shared by everyone and not just a playground for the rich. (Sparks 1993:9)

Sparks has no reason for stating that the reserve is a playground for the rich as no entrance fee is charged. It can only be surmised that the popular media has influenced his letter to the press.

The management of the reserve realizes that the community needs to be involved in the reserve and one of the management plan objectives is "to create more opportunity for community involvement in the reserves" (Queenstown Municipality 1994). The reserve is also to be used for education purposes with the objective of creating an environmental education facility on the reserve. As the nature reserve in Queenstown is too small to merit the appointment of an education officer the teachers would have to be involved in the development of the reserve as a teaching resource.

2.4 SCHOOL SUBJECTS AND ENVIRONMENTAL EDUCATION

Environmental education should be interdisciplinary in its approach (Clacherty 1990, Irwin 1990, Orr 1992, EEPI 1994). It should be integrated into subjects and draw on the unique capacities of each subject (EEPI 1994). Although integrating environmental education into subjects is a goal of environmental education, the integration of environmental education into the curriculum first needs to take place. The EEPI document (1994) suggests ways integration could be done.

Nightingale (1987) argues that there is a need to de-emphasize the role of subject disciplines as the separation of the curriculum into subjects is artificial and denies the child insights in the interrelatedness of knowledge.

Ballantyne and Oelofse (1989) agree that knowledge is compartmentalized as syllabuses constrain the content to be taught in schools.

The process of syllabus construction and the subject-based nature of the school system leads to the compartmentalisation of knowledge. The result of this is that teacher co-operation across subject boundaries is almost non-existent.
(Ballantyne & Oelofse 1989:10)

They suggest that "one mechanism to encourage teachers to confer across subject boundaries is to involve them in team-teaching and fieldwork" (Ballantyne & Oelofse 1989:10).

As it is unlikely that discrete subject areas will change in the near future it thus becomes important to identify subjects which can be used for cross-curricular activities. Many articles were found that relate to environmental education in specific subjects. Baines (1988), Pirrie (1988) and Martin (1993) point out that language teaching has an important contribution to make to environmental education. This could range from a basic level where literacy skills are the key to empowering people to take part in local decision making, to a specific language as discipline. Clacherty (1986) looks at English as subject, while Nieman & Loubser (1992) look at Afrikaans as subject.

The 'arts' whether Art, Music or Drama are important as they "are our means of realising and expressing subjective emotive reactions" (Martin 1993:24). Although Music has a role to play (Whitburn 1972, Paynter 1988), Art especially has an important role to play (Mitchell 1972, Clacherty 1986, Hardy 1988, Joicey 1988). Hardy (1988) looks at how the study of fine art can teach us about the environment. Not only artists, but also viewers who are unschooled in the formal analysis of fine art can achieve a better understanding of the environment. Clacherty (1987) believes that Art can make a major contribution to students' aesthetic development.

There are sound reasons for using Art in environmental education. The obvious benefit lies in the development of observational skills and in creating awareness of the environment. Beyond this, however, lies the development of personal judgement of aesthetic quality, the sharpening of critical faculties and the development of creative confidence. Emerging from this aesthetic growth comes an ability to be a 'noticer' and an awareness based on personal experience of what is aesthetically acceptable in the environment. (Clacherty 1987:46)

Religious education is another aspect that is important as beliefs and values people hold determine the way they "perceive the world they live in and the relationships they have with people and the environment" (Martin 1993:24).

History is also an important aspect of environmental education as history contributes to an understanding of the root causes of environmental problems (Shah 1988, Martin 1993).

Khan (1989) feels that History is an important aspect of environmental education in South Africa and can be used

as a creative tool not only in exploring current environmental issues, but also in determining strategies for the future.

(Khan 1989:4)

Gamble (1988) has found that history has made particular use of outdoor experiences and local resources in learning situations.

Although each subject in the curriculum could be developed to play a part in environmental education, Biology and Geography have been recognised as subjects that are more "obviously environmental" than others (Gamble 1988, Hale 1991, Martin 1993, EEPI 1994). Clacherty (1990:40) warns that there is a danger in placing undue emphasis on specific subjects as 'obvious' vehicles of environmental education since the result could be that the teachers of other subjects could perceive that environmental degradation is not directly their problem and thus not realise that environmental issues and problems are complex and multi-faceted.

Schreuder (1987,1991,1992) who would also like to see a cross-curricular element brought in when teaching about the environment regards Biology as a key subject. He points out that Biology is one of the most popular school subjects in South Africa and is therefore a very powerful vehicle for the objectives of environmental education. Loubser (1989,1993) who looked at the recent research into the teaching of Biology points out that an environmental education approach is needed in school syllabi but that it has not yet become an official policy in education departments.

Reading the literature regarding various subjects and the environment highlighted the potential that exists for environmental education. There is however nothing written in South Africa about the teaching of different subjects in nature reserves. I realize that environmental education should be inter-disciplinary but, as I wanted to work with a cross-section of schools, all the subjects could not be involved as the group would be too large. As I wanted the project to be cross-curricular and wanted to make use of the local nature reserve, it seemed that involving the Geography and Biology teachers of Queenstown would be an effective starting point.

The ecology section overlap between Geography and Biology syllabi would give the group a common starting point. I would

also be more confident working with the Geography and Biology group as I have taught both of these subjects.

Ecology is at present a section of both the Geography (Std 10) and Biology (Std 8) syllabi. Hale (1991) points out that these two subjects compliment the teaching of ecology with the

science curriculum [Biology in RSA] providing the basic understanding of ecological concepts and processes, and geographical studies [Geography in RSA] allowing for the application and extension of the skills, knowledge, and understanding of ecology in specific cases or investigations.

(Hale 1991:20]

Adamczyk *et al.* (1994) notes that in Britain there is considerable overlap between Science and Geography and suggests that teachers work together to pool their expertise and so avoid unnecessary and time-consuming duplication in overcrowded school timetables.

Various resources were found that look at the teaching of ecology (Hale 1986, Gamble 1987, Moodie 1987, Evans 1988, Wagiet & Mackenzie 1992). In general, concern is expressed about the way in which ecology teaching is taking place.

Most teachers recognize that ecology is a field-based subject, but the provision of adequate field experience for pupils is generally lacking.

(Hale 1986:179)

There can be many constraints to the teaching of ecology with one of the main reasons being a lack of teacher confidence in the field (Hale 1986, Gamble 1988, Loubser 1989, O'Donoghue & McNaught 1991). When O'Donoghue & McNaught (1991) evaluated the Action Ecology Project, which set out to improve science fieldwork by developing materials for an environmental education approach to ecology fieldwork, they found that

teachers also lacked knowledge about the environment, had little suitable fieldwork techniques for environmental education, and thus lacked confidence in their ability to conduct excursions.

(O'Donoghue & McNaught 1991:394)

2.5 CONCLUSION

Although the local environment has great educational potential it is not fully utilized in South Africa. As nature reserves are part of the local environment they have an important educational role to fulfil. If an educational component is introduced into the Queenstown reserve it is hoped that it will be utilized by more people. Environmental education could be integrated into many subjects. Suitable subjects for a cross-curricular approach seem to be Geography and Biology.

CHAPTER 3

METHODOLOGY

The purpose of this chapter is to indicate why I chose to use the method of action research, how the research process was carried out and an evaluation of the process.

3.1 THE METHODOLOGICAL APPROACH

Although I thought it would be worthwhile to develop the nature reserve as a cross-curricular resource (refer chapter 1, section 2.4), I first had to find out whether the other teachers also saw that potential and if they would want to develop the reserve as a teaching resource. If they did, action research would seem to be an appropriate method, as it would be flexible and adaptable enough to accommodate constraints in the schools, such as timetables and extra-mural activities.

There is a range of opinions of what action research entails (Kemmis & McTaggart 1988, McNiff 1988, Cohen & Manion 1989, McKernan 1991). The definition that would describe the research that I had in mind was that of McNiff (1988:4) where action research is defined as

an approach to improve education through change, by encouraging teachers to be aware of their own practice, to be critical of that practice, and to be prepared to change it. It is participatory, in that it involves other people as part of a shared enquiry. It is research WITH, rather than research ON.

Action research is distinguished from other research approaches not only by its techniques but in terms of its characteristic method. It follows a widely accepted cyclic pattern as described by Kemmis and McTaggart (1988:10) i.e.

To do action research, a group and its members undertake:

- to develop a plan of critically informed action to improve what is already happening.

- to act to implement the plan.
- to observe the effects of the critically informed action in the context in which it occurs, and
- to reflect on these effects as a basis for further planning, subsequent critically informed action and so on, through a succession of cycles.

The following main principles of action research were intended to be met by the research project:

Action research is **situational** (Cohen & Manion 1989, McKernan 1991). This means that the research takes place in the setting where the problem is encountered. The group were going to work in Queenstown and have their workshops in the nature reserve as such.

Action research is **collaborative** (Kemmis & McTaggart 1988, Cohen & Manion 1989, McKernan 1991). As action research is a group activity it would be possible for the researcher to work together with the nature conservation officer and the teachers as a team.

Action research is **participatory** (Kemmis & McTaggart 1988, Cohen & Manion 1989, McKernan 1991). The group members could participate in the research. As all the members possess certain skills they could all contribute. Through research the group members could work towards the improvement of their own practice as action research encourages a teacher to be reflective of his/her own practice.

Action research is **self-evaluative** (Kemmis and McTaggart 1988, McNiff 1988, Cohen and Manion 1989). This would mean that as the project progressed, modifications would continuously be evaluated within the ongoing situation, the ultimate objective being to improve the use of the nature reserve.

Further it was hoped that involving the teachers would be a means of professional development, thereby equipping the teacher with new skills and alternative approaches to teaching certain sections of work.

3.2 THE RESEARCH PARTICIPANTS

In designing a collaborative project like this the stakeholders had to be identified which meant involving the municipality, which administers the reserve, and the principals and teachers of various schools in Queenstown. I approached the nature conservation officer of the nature reserve who was enthusiastic about the idea of developing it as a teaching resource. Consequently a letter requesting official permission to take the group into the reserve to work was sent to the Head of the Parks Department and the Town Clerk. After being tabled at a municipal meeting permission was granted for the group to work in the reserve (see Appendix 1).

Six schools were approached to take part in the project (refer chapter 1). I could not include all the schools in town as the group would be too large, so I chose specific schools at the outset of the project. Schools A, B and C were chosen as I knew all the senior Geography and Biology teachers at these schools. School D was selected for inclusion as the school borders on the local nature reserve. Schools E and F were chosen to reflect my desire for involvement of a wide range of schools which had been under the control of the then Cape Education Department, Department of Education and Training, and Department of Culture, House of Representatives.

I first approached the teachers of schools A, B and C to hear how they felt about doing such a project and if they would be part of my research. As they were keen to form a research-group I then spoke to their respective principals to inform them about the proposed project and which teachers were going to participate (see table 3.1).

Schools D, E and F were approached differently as I did not know who their senior Biology and Geography teachers were. I first spoke to the principals and explained what I wanted to do and why I wanted to do this project. The principals gave

me permission to work with their teachers and identified the teachers that I could work with. Having to get permission from principals is not how action research is supposed to take place, but this is a constraint of the schooling system and as a researcher I had to be aware of that. Informal talks were then held with the teachers who were all agreeable to the idea of taking part and thought that such a project was worthwhile.

Table 3.1 Key to nomenclature used in thesis

School	Teacher
A	A1g A2g A3b A4b
B	B5b B6g
C	C7b C8g
D	D9g
E	E10b E11g
F	F12g F13b
Notes: g = geography teacher b = biology teacher	

The teachers that were to be involved in the project were either the HODs of Biology and Geography at the respective schools or the senior Biology and Geography teachers. As only a limited number of teachers could take part in the project an assumption was that by involving the senior teachers in the project they would in turn include the other Biology and Geography teachers at their respective schools (refer section 6.1.1).

All the teachers participating in the project had been living in Queenstown for a minimum of 8 years and I presumed that

they would know the area quite well. This was not however the case as I found out when interviewing teacher Ellg who had lived and taught in Queenstown for 30 years but had never been to the reserve (refer section 5.3.3).

3.3 WORKSHOP AND INTERVIEWS

At initial talks with the teachers of the various schools a date was agreed upon for a first workshop. This workshop was to be held at school C. A workshop is one of the techniques that could be used when doing action research (Cohen and Manion 1989).

Although I intended using workshopping extensively there is a lack of literature available on this research technique in a South African context. I could however draw on the experiences of Kruger (1992) and Ashwell (1992). There is however literature available on focus groups which were also used. Anderson (1990:242) has found that focus groups

work because they provide a setting in which individuals are comfortable in self-disclosure and, furthermore, where the group dynamics create a chain of reactions designed to exhaust the views of the issue or topic. They work, in part because of the skill of the leader in planning and conducting the group, in part because of the group composition, and also because the participants are in some way motivated to focus on the issue at hand.

I found that when the group worked together we would fluctuate between focus groups, where information was solicited by me, and a workshop where many new ideas were generated collectively. During workshops all group members interacted and a collective opinion would be formed which included me as researcher. Workshops evolved as the project developed. In the beginning I had to give a lot of input but in later workshops my input became less and less. Schools A and B were more adept at workshopping while schools C, D and E seemed to be more comfortable with the focus group. This was also one of the reasons why I split the group for the debriefing interviews.

Table 3.2 Table of Events

DATE	EVENT	WHERE HELD	NO IN GROUP	NOTES	CONSTRAINTS	MATERIALS
1994 FEB						
10-11	Preliminary discussions					
	Teachers	Schools A, B, C	8	Is such a project viable.		
	Nature Conservation Officer	Nature Reserve	2	Would they want to take part in such a project.		
24-25	Preliminary discussions					
	Teachers	Schools B, D, E, F	7	Information about project. Would they want to take part		
	Principals	Schools A, B, C, D, E, F	7	Information about project. Intend working with their staff members.	Headmaster of school E on sabbatical.	
	Municipality	Parks Department	2	Could group work in reserve.		
MARCH						
23	First workshop	School C	11	What is environmental education. Workshop the scope of the project. Group decides on workshop in reserve (taped workshop).	Political rally - Teachers of School F can't attend. Noise of observer on plane. Nature conservation officer 40 minutes late.	Handouts about EE. A3b gives handout with her ideas on project.
					School holidays	

DATE	EVENT	WHERE HELD	NO IN GROUP	NOTES	CONSTRAINTS	MATERIALS
APRIL						
26	Second workshop	Nature reserve	11	Visit 3 sites in reserve. Discuss teaching potential of sites. Discuss who is to do worksheets. (scribe takes notes).	General election 27, 28 April - teachers of school E can't attend as they are election monitors. Leave late as we wait for school E. Nature conservation officer called out over radio and has to leave. Teachers from school C leave early to attend rugby practice.	1:10 000 maps of reserve. Table of game counts. Carrying capacity of veld. A3b gives handout about grass and some animals in reserve.
28	Post workshop interviews	Homes of teachers	7	Individual interviews. Clarification of certain aspects of second workshop (tape interviews).	Unexpected long weekend due to extended elections - all workshop participants can't be interviewed.	
MAY					Reserve closed for game capture.	Fax research participants summary of interviews. Orthophoto maps of reserve. Mapwork worksheets. Soil erosion information sheet.
JUNE					Reserve closed for game capture. School exams.	
					School holidays.	

DATE	EVENT	WHERE HELD	NO IN GROUP	NOTES	CONSTRAINTS	MATERIALS
JULY						
29	Small group discussions	Homes of teachers	9	Progress on worksheets. What next step should be (take notes).	Nature conservation officer on leave. Teachers of school E busy with exams.	A3b worksheet on grasses.
AUG						
22	Third workshop	Nature reserve	13	Visit 2 sites in reserve. Cecil Nonqwane - traditional uses of plants. Barry Irwin - use of waterkit. (take notes)	Nature conservation officer can't attend. Teacher A4b on sick leave.	
22,23	Debriefing interviews	Homes of teacher school C	10	Group interviews	Due to extra-mural activities have a group interview in the evening.	
SEPT						
					School exams.	Traditional uses of plants information sheet.
					School holidays.	
OCT						
						A3b additional information sheets on plants. Project about history of the reserve by Margo Muller.
NOV						
11	School A - Std 6 reserve day	Nature reserve	+ - 95	5 modules presented. Teachers A1g, A2g, A3b, A4b, E10b and E11g present modules.	I can't attend reserve day. Presenters of school E increased workload as during school hours. School exams.	Std 6 reserve day worksheets.

DATE	EVENT	WHERE HELD	NO IN GROUP	NOTES	CONSTRAINTS	MATERIALS
1995						
	School A - Std 8 reserve day.	Nature reserve	+ - 80	5 modules presented. Teachers A2g, A3b, A4b, a geography teacher from school A and myself present modules. Biology teachers of school E are observers.	Rhino charges vehicle of one group. I have increased workload as during school hours.	Std 8 reserve day worksheets.
	Queens College Junior - Std 5 reserve day	Nature reserve	+ - 90	3 modules presented. Nature conservation officer, a teacher from Queens Junior and myself present the modules.	I have increased workload as during school hours.	Std 5 reserve day worksheets.
	School C - Std 8 reserve day	Nature reserve	+ - 55	3 modules presented. Teachers C7b, A2g and myself present modules.	Rhino in vicinity where one module is to be presented. Teacher A2g has increased workload as during school hours.	Std 8 reserve day worksheet.

The aim of this first workshop was for the members of the group to meet each other and to discuss how we, as a group, proposed developing an education programme for the reserve. If we were to work together it would be necessary to make joint decisions. Unfortunately the day of the first workshop coincided with a big political rally and the teachers of school F were not prepared to travel through town for the workshop. Although school F indicated that they wanted to be part of the group, even though they could not attend the first workshop, they effectively dropped out of the study at that point as they did not attend further workshops. One of the teachers of school B could also not attend the first workshop and dropped out for the rest of the study. Eleven people participated in the first workshop which included four Geography and five Biology teachers, the nature conservation officer and myself (see table 3.2).

This workshop was taped, with the agreement of the participants, so that it could be analyzed later. The advantage of tape recording is that it gives a full record of a potentially rich source of data (Anderson 1990). At the first workshop I explained why I was interested in developing the reserve and what I would gain from the project. Workshop participants were given handouts (see appendix 2) which included:

- a short summary of Fien's (1993a) concept of education **about, through** and **for** the environment.
- three definitions of environment (IUCN 1971, UNESCO 1985, O'Donoghue 1993).
- a copy of the Tbilisi principles (UNESCO-UNEP 1978).
- four-dimensional model of environment (O'Donoghue 1993).

In retrospect I feel that the group should have workshopped the whole concept of Environmental Education as I found during the post-workshop and debriefing interviews that the group members never got round to reading the handouts. At the first workshop the group reconfirmed that they wanted to develop the nature reserve. As some teachers did not know the reserve

well it was suggested by a teacher that:

Maybe our starting point is that we must get out there together and we must each have our input and we can then sift out what can work because at the moment many of us are shooting in the dark, if we haven't been up there we are not quite sure what is to offer there.

It was generally felt by the group that a workshop in the nature reserve would create the opportunity for everybody to familiarize themselves with the reserve and enable them to provide input. It would also help to clarify the future aims and goals of the project. At the first workshop the group also indicated that they would like to have a map that they could work from as there were no detailed maps available for the reserve. With the help of the nature conservation officer I drew a 1:10 000 map, working from the ortophotos of the reserve, which included the new boundaries of the reserve. This map of the reserve was then reproduced for the group by the Municipality and given to research participants at the second workshop.

Eleven people took part in the second workshop which included four Geography and four Biology teachers, the nature conservation officer and the researcher (see table 3.2). Unfortunately the teachers of school E could not attend this workshop as they were monitors for the general election of 1994 which was to take place later that week. A non-participant observer was brought in to act as a scribe as the workshop could not be taped out of doors due to the fact that the group was walking through the reserve and was widely spread out. I found that it was useful having a scribe as I could participate fully while knowing that the scribe was taking down the relevant data.

The aim of this workshop was to familiarize the participants with the nature reserve. Various members of the group gave their input at the three sites that were visited that afternoon (refer section 4.3). After visiting the nature reserve the group went back to school C where they decided

what worksheets they wanted to develop (see appendix 4).

As a result of the workshop itself it was felt that I needed to interview the participants afterwards although this had not initially been planned.

Interviewing was decided on as it is "an important way for the researcher to check the accuracy of - to verify or refute - the impressions he or she gained through observation"

(Fraenkel and Wallen 1993:385). Semi-structured interviews (Burroughs 1975) were used as I knew most of the members of the group and thought that they would respond better to this approach to interviewing. The type of question asked was what Fraenkel and Wallen (1993) term 'opinion or values' questions. These are questions researchers ask to find out what people think about some topic or issue or problems they are engaging with. The questions were all open-ended (Cohen and Manion 1989) as I could go into more depth, clear up misunderstandings and make assessments.

I interviewed six members of the group individually two days after they had participated in the workshop in the reserve. Only six people were interviewed as all the members were not in town as there was an unscheduled long weekend due to the elections. I could not interview them the following week as I had to be in Grahamstown for coursework. The impression that I had gained after the second workshop was that there had been tension in the group about certain aspects and this needed verifying. These interviews had to take place as soon as possible after the workshop while it was still fresh in the minds of the participants. As this project is part of action research, which follows a cyclic pattern (Kemmis and McTaggart 1988, Cohen and Manion 1989) it was essential to define the problems as they arose, reflect on the problems and then act on a revised plan. So the purpose of interviewing was to find out what was on their minds and what they thought and felt about the workshop that had taken place in the nature reserve. The interviews were conducted in Afrikaans or English

depending on the home language of the interviewee. Three questions were prepared beforehand but I changed the wording, explained the questions and added to the questions as I interviewed. The sequence of the questions was however the same. Some participants were not comfortable being interviewed and kept on looking at the tape recorder. I was not comfortable interviewing the group members even though I knew them all. Listening is regarded by Seidman (1991) as the most important skill in interviewing. I found it difficult to keep quiet and listen actively. It was difficult to wait if an interviewee did not immediately reply after a question and I tended to prompt too soon.

Because this is a collaborative study and the aim is for the participants to have critical-reflective ownership of the process and results (McKernan 1991), I felt that the schools needed to know what had come out of the interviews and accordingly sent the participants of each school a fax with a summary of the interviews and also to confirm what worksheets the group were working on. School E indicated that they wanted to catch up on the workshop they had missed out on but although efforts were made to try and organise a visit to the reserve during June and July these were unsuccessful as the reserve was closed for two months for game capture and hunting.

Due to school exams and midyear holidays the earliest the group could reconvene was at the end of July 1994. I had planned to have another workshop but unfortunately a suitable time for the whole group to meet could not be arranged so I spoke to group members individually or in small groups (refer section 4.5). The group members discussed the possibility of bringing in someone to demonstrate the Sharenet waterkits as well as bringing in a herbalist from Grahamstown to talk about the traditional uses of plants. Progress of the worksheets was also discussed.

A workshop that would take place in the reserve was organised for the end of August 1994. This was to be a workshop where people from outside the group would be brought in. Barry Irwin (a Std 10 pupil of St Andrew's College, Grahamstown) joined the group to demonstrate the Sharenet waterkit with which he had worked extensively, while Cecil Nonqwane (the education officer from Albany Museum, Grahamstown) talked about the traditional uses of plants. The teachers from all the participating schools (see table 3.2) joined us in the reserve and the group spent the whole afternoon there.

After the workshop in the reserve, debriefing interviews were held with all the participants (refer section 5.3). The purpose of these interviews was to determine whether there had been shifts in thinking, how the participants now viewed the project and whether they thought it could be an ongoing project beyond my immediate thesis requirements. The group was divided into three smaller groups for the debriefing interviews that were all taped so that they could be analyzed at a later stage. The advantage of group interviews is that group members "can be helped and stimulated both by their own interaction with other group members, and by watching and listening to other people interacting" (Hedges 1985:73). I felt that the group should not be interviewed as a whole as some members of the group had not been participating when the group was too large. As school E had missed out on some of the earlier workshops they were interviewed separately as some of the questions had to be modified accordingly. Although research participants of school E are Xhosa speakers they were interviewed in English, which is the language of instruction at the school, as I do not speak Xhosa. The rest of the group was divided into the Afrikaans speakers and the English speakers. This was done as the Afrikaans speaking members of the group had not participated spontaneously when they were with the English speaking group and this way I could do the debriefing interviews in either Afrikaans or English. Due to end of year assignments and exams I only had time to

analyze these interviews three months later. This was problematic as data analysis should take place as soon as possible after a workshop or interviews (Anderson 1990). The analysis was not passed back to the participants as the school year had ended and they were on holiday. Not having passed the analysis of the workshop back to the research participants caused a break in the cyclic pattern of action research so I cannot claim that I engaged in a pure action research process.

3.4 EVALUATION OF THE METHODOLOGY FOLLOWED

Although I found that action research was the appropriate method of research in the specific circumstances there were some factors that facilitated the research as well as some constraints.

3.4.1 Factors that facilitated research

- *Familiarity with the research participants*

As I knew most of the teachers I found that it was easier for them to participate and that they trusted me. I also knew what areas of expertise the teachers had. I had also worked with the nature conservation officer on various previous occasions.

- *Familiarity with the schools*

I knew which schools were doing cross-curricular work and which were taking their scholars on field trips for either Geography or Biology. That is also the reason why I chose four participants from school A as they were familiar with cross-curricular excursions.

- *Knowledge of area*

As I knew the area in which the group worked, I was confident in taking the participants into the reserve.

- *Participants knowledge of my work in reserve*

Most participants were aware of the work I had done with

groups of children in the reserve before, as well as that I was studying for a nature conservation diploma in addition to a M.Ed. They believed that I could be of help to them.

3.4.2 Constraints to the research

- *Organizational problems*

The amount of organization that went into each workshop was very time consuming (refer appendix 3). As I was a fulltime student at Rhodes University during 1994 I was not resident in Queenstown at the time of research and all organization had to take place by telephone or fax. As different schools were involved finding a time that would suit everybody to attend workshops was problematic. Teachers were not available for workshops during exams (which differed from school to school) and holidays, while extra-mural commitments were difficult to reschedule. The nature reserve was also closed for close on two months for game capture and hunting. Due to personal circumstances the nature conservation officer was not able to take part in some of the workshops.

- *Political problems*

There were schools that could have been included in the research but inclusion was made impossible by the security situation early in 1994. The first workshop also coincided with a political rally in town which resulted in school F not wanting to travel through town. The noise caused by a low flying observer aeroplane used during the rally also made transcriptions of the tape of the first workshop difficult. The second workshop was held close to the April 1994 election date and the teachers of school E were election monitors and could not attend this workshop. An unscheduled public holiday during the elections also meant that only six people could be interviewed after the second workshop as I had to return to Grahamstown for coursework.

- *Financial*

The research turned out to be more costly than I estimated. This was mainly due to the high cost of telephone calls and faxes. As there is not an efficient postal service between Grahamstown and Queenstown letters were not considered as a viable alternative. Travelling between Grahamstown and Queenstown was also costly.

3.5. EVALUATION OF OWN RESEARCH PROCESS

I feel that I did not do 'pure' action research as intended but rather a modified form of it. I regard it as 'modified' for a number of reasons, namely that research participants were chosen by me specifically (refer section 3.2) and that I had to get permission to do research from headmasters (refer section 3.2) as well as the municipality (refer section 3.2). Further I did not follow a cyclic pattern strictly (refer section 3.1) as I made decisions on my own (refer section 3.3). Research participants did not always have the opportunity to respond to feedback and sufficient feedback was not given after the last workshop.

I do however feel that this modified form of action research was the appropriate method to address the practical issue of developing a nature reserve as a cross-curricular teaching resource. Improvement and involvement, which are two of the essential principles of action research, did take place (refer section 6.1.1). It was also suited to the situation as I wanted the research to be a group activity. By using this method, professional development took place where the teachers were equipped with new skills and methods. The participants' awareness of their own abilities was strengthened. Teachers found that they did actually have sufficient knowledge. I found that this type of research worked as I was from the area and knew the participants. It would have been difficult for an 'outside' researcher to come in and do action research in only one year.

There were however limitations to using the method of action research. One of the principles of action research is that it has to be collaborative, where all the stakeholders have a right to be included (Kemmis & McTaggart 1988, Cohen and Manion 1989, McKernan 1991). It was however not practical to involve all possible stakeholders as this would have had to include all the teachers, parents, pupils and ratepayers from the town. Action research does not lend itself to large groups and therefore I chose to work with only the senior Geography and Biology teachers of six schools (refer section 3.2). Not all the stakeholders that took part in the project had the same level of interest in the project (refer section 6.1.2). Because stakeholders (such as school F) dropped out of the project, I did not get the full departmental representation that I had hoped for originally.

Bringing all the stakeholders together did not necessarily mean that they would immediately function well as a group. It was the first time that the teachers had worked together across schools and culture. Although the group worked harmoniously together, there were still internal groupings according to language.

Cohen and Manion (1989:227) stress that it is

important that teachers taking part in the project are truly involved, that they know what the objectives are, what those imply, and that they are adequately motivated.

Having such a diverse group meant that group members set out with different expectations and experiences. Developing the reserve as a teaching resource was a high priority for me, while for some of the members it was of a lower priority. This could have been one of the reasons why the development of all the worksheets did not take place (refer section 6.2).

It later became clear to me that some of the research participants were not clear about my role in the project. During the debriefing interviews teachers E10b and E11g asked

me what exactly I was doing at Rhodes University, despite this being made clear during the first workshop (refer section 4.2.1). The problem could have been that I was too theoretical with the group during the first workshop or because school E could not attend the second workshop which was held in the reserve.

At times during the research events would follow one another very quickly. For example in the second workshop and the follow-up interviews, there was not adequate time to reflect upon and redefine a problem as might have happened. Colyn & Breen (1989) caution researchers that if what is learnt in one cycle is not used in further cycles, action research can lapse into problem solving. To an extent this did happen as I did not give the participants the analysis of the debriefing interviews so they could not have learnt from it. To some extent action research is problem solving as I had identified a problem, set out to resolve it and went a long way in achieving this (refer chapters 5 and 6).

Although I was a participant in the whole process the group depended heavily on me to initiate the action and to keep the action going. I found it difficult being initiator, participant and observer at the same time and had little control over the direction the research took. To me it felt as if the aim of the project was shifting when the participants took a workshop in a different direction. In retrospect this was not so as the long-term aim was still to develop the reserve as a cross curricular teaching resource but the participants elected not to stay with that aim in the short term as they had a more immediate need for professional development. During 1995 I could see the consequence of the professional development as school groups were brought into the reserve. Throughout the research I found it difficult to know what to collect as data and how to analyze it as a similar project had not been done before in South Africa.

As the research progressed it became clear that it meant a long-term involvement. It is difficult to do action research on a short-term basis, such as a year. It will be difficult for me to extract myself from the group as they expect me to lead the process (refer section 5.3.14 and 5.3.15).

What came out in the research can not always be communicated beyond the participating group. Generalizations will be problematic as the group specifically focused on the Queenstown nature reserve. It is nevertheless hoped that much can be learnt from this experience and shared with other researchers.

3.6 THE RESEARCH PROCESS

The research project fell into two phases. During the first phase I determined the extent of the need for such a project and the group members' view of the project. It also included the workshop in the reserve, post-workshop interviews and small group discussions (chapter 4). The second phase included bringing in people from outside and the debriefing interviews of the project (chapter 5).

CHAPTER 4**COLLECTING DATA: EARLY STAGES**

The purpose of this chapter is to look at how the project was initiated. This included initial talks I had with the principals, teachers, nature conservation officer and municipality. It also includes what took place during the first and second workshops as well as the post-workshop interviews that were conducted after the second workshop. A look at the small group discussions concludes the chapter.

4.1 PRELIMINARY DISCUSSIONS WITH PRINCIPALS AND TEACHERS

To determine whether the development of the reserve would be a viable project informal discussions were held with the principals of the various schools as well as the teachers.

4.1.1 Principals

Appointments were made with all the principals. I briefly told the principals about the course I was doing at Rhodes University and that my research topic was the development of the local nature reserve as a teaching resource, in collaboration with the Geography and Biology teachers of six schools. The principals did not foresee any problems if their staff took part in the project as long as it did not interfere with their other school activities (refer section 6.2). The reactions of the principals are summarized in table 4.1. Although I thought that the principals of schools E and F did not seem interested it could also have been attributed to the fact that they were not used to being approached by another school to participate in a project as the other schools in town seldom involved them in inter-school activities.

Table 4.1 Initial talks with principals

School	Reaction of principal
A	<ul style="list-style-type: none"> • Interested in intended cross-curricular approach. • Thinks project worthwhile as his staff-members would benefit. • School's facilities available if need for research project.
B	<ul style="list-style-type: none"> • Principal in a hurry. Cannot gauge his reaction.
C	<ul style="list-style-type: none"> • Encouraging. Hopes project will be success.
D	<ul style="list-style-type: none"> • Interested and supportive. • Thought it would be a stimulating experience for the geography teacher as he seldom has the opportunity to work with the other subject teachers in town.
E	<ul style="list-style-type: none"> • Does not appear interested.
F	<ul style="list-style-type: none"> • Does not appear interested.

The principals were not contacted again during the project and in retrospect I think that if regular feedback had been given to them, either by the teachers at their schools or myself, their continued interest might have stimulated the project more. The exception was the principal of school A who spoke to me later in the year about the project. I could deduce that the teachers involved in the project had told him about what they had been doing at the reserve and that he was enthusiastic about what had been done.

4.1.2 Teachers

I spoke to the teachers either at their schools or at their homes. Although all the discussions were on an informal basis the same points were raised with each teacher or group of teachers.

- *Utilization of nature reserve for teaching purposes*

I wanted to know if they had used the reserve for teaching purposes before as work that had been done previously could

possibly be used during the project. It was found that only schools A, B and C had used the reserve for teaching purposes before. Table 4.2 summarizes the previous use of the reserve.

Table 4.2 Schools' use of nature reserve

School	Std	Purpose	Subjects involved
A	6	Cross-curricular reserve day	Geography, Biology, English, Mathematics
	10	Geography revision: mapwork, geomorphology ecology, settlement geography	Geography
B	8	Ecology	Biology
C	9	Soil erosion	Geography
	10	Ecology	Geography
D	6-10	Recreational use	-
E	-	-	-
F	-	-	-

One of the reasons why schools E and F do not use the reserve is the fact that they are the schools situated the furthest away from the reserve (see figure 1.1). As they do not have any school transport taking even small groups of pupils to the reserve is problematic.

● *Why is the reserve being under-utilized?*

I wanted to know why the reserve was under-utilized by the schools of Queenstown. The teachers of schools A, B and C came up with various reasons why the reserve was not being utilized to its full extent. It seemed that most of the problems centred around the teachers themselves. A lack of knowledge was identified as one of their major problems. They lacked confidence as they felt they did not have an environmental background and had not been trained how to use

such a resource. They felt teachers need to be equipped so that they can think beyond the textbook as they are used to having everything worked out for them. As they were not confident they felt they needed something such as in-service-training or teacher workshops. Teachers at school A also thought that many teachers had an innate fear that their subjects were being threatened and did not want to become involved in cross-curricular activities. They suggested that by using a think-tank method the group could look at teachers needs and try to convince them of the importance of developing the reserve. Teachers at schools D, E and F did not say much. At schools E and F this could have been because they did not know me and were not confident in talking to me. School D mentioned that the group would have to keep in mind that all their pupils take their subjects on standard grade or lower grade. School E said knowledge was a problem and school F was not sure whether they would be allowed to take the children out of the school grounds.

● *Should the group, develop the reserve?*

The teachers were then asked whether they thought that the group should develop the reserve as a teaching resource. The reaction of the teachers varied from school to school.

School A. The teachers were very enthusiastic saying that there was a lot of potential and that effort was needed. They wanted to involve the other subject teachers at their school as well. They also considered the outdoors to be a better environment to stimulate lateral thinking in subjects. They felt that if the group decided to develop the reserve it should be an ongoing project.

School B. The teachers were positive about the idea as well. Both schools A and B felt that there was a need to develop an outdoor education centre in the vicinity as travelling to outdoor education centres such as Thomas Baines, near Grahamstown, and Ugie was becoming too expensive.

School C. The teachers thought that the reserve had lots of potential and that a hands on experience was needed. They thought that if the reserve was more widely used the municipality would put more money into developing the reserve. Schools B and C would like to see that resource development is syllabus specific and that work done in the reserve has to be examined or used for a practical mark. They also wanted to know who our target group would be if we developed the reserve. School C felt that the target group should be Std 6-8.

School D. The teacher was very cautious and did not want to commit himself. He was surprised that I wanted to include their school in the project.

School E. The teachers would like to become involved as they had never done anything like it before. They felt that they were on a "political island" but that their pupils needed exposure to something like the nature reserve.

School F. The teachers appeared sceptical about the whole idea and did not know whether developing the reserve would be a good idea or not.

The **nature conservation officer** was positive about the idea of developing the reserve as he feels that "conservation and people must be combined". He sees the reserve as having more than enough potential with the problem being that the teachers are not using the reserve as they do not know what is available in the reserve. He felt that the project should be aimed at equipping the teachers so that they are able to use the nature reserve.

As there was considerable support for the idea of developing the nature reserve as a teaching resource, I went ahead and set a date, which suited all the members of the group, for a first workshop.

4.2 FIRST WORKSHOP

The first workshop was held in the staffroom of school C on 23 March 1994. The teachers of school F could not attend due to a political rally that was being held in town (refer section 3.4) and teachers A2g and B6g could not attend as they were still coaching sport.

4.2.1 Introduction to the workshop

As various members of the group had expressed an interest, during the initial talks, about the environmental education course I was doing, I thought it would be a good idea to inform briefly the research participants about some aspects of environmental education. Having assured the research participants that the workshop would not take longer than an hour, I did not want to spend a lot of time doing this so prepared a handout for the group (see appendix 2). The handout consisted of:

- Three definitions of environmental education - IUCN (1971), UNESCO (1985) and O'Donoghue (1993),
- a short summary of the **about**, **through** and **for** approaches to environmental education (Fien 1993a),
- the four dimension model of environment which presents the concept as four interdependent realms of meaning: biophysical, economic, social and political (O'Donoghue 1993) and
- the Tbilisi principles of environmental education (UNESCO-UNEP 1978).

In retrospect I should not have given them these handouts without working through them with the group. Giving them three definitions only confused them as they did not compare them to get the sense of different approaches to environmental education. At that stage I was not confident that I could answer questions the group might ask about environmental education as I was only at the beginning of my master's course and lacked a lot of background theory. I would like to remedy this shortcoming by possibly having a workshop with the group

about environmental education at a later stage.

I also gave each school a copy of my research proposal. This was not the final copy of my research proposal and substantial changes were still made to it later on. I did not discuss the research proposal with the group and found out later that the group members had not read the handout.

I then dealt with the reason why the workshop was being held by telling the group that at the initial talks the different members of the group had decided that they wanted to develop the reserve, but that the group had to decide how it was going to do it. I pointed out that teachers tend to teach facts with the textbooks being seen as containing all the knowledge. If we were going to take pupils out to the nature reserve we, as teachers, had to do something extra that could not be done in the classroom. The nature reserve has to be for the people and I feel that one of the ways to bring this about is actually to do some education in the reserve. I stressed that when developing the nature reserve a participatory approach was needed:

this whole approach that I am hoping we would take, is that we are working together as a team to develop Lawrence de Lange [nature reserve] as an educational resource

We needed to work together so that we might learn to know each other and learn from each other.

4.2.2 Workshop discussion

As the workshop progressed various points were raised. These points are summarized under the following headings:

- *Current use of the nature reserve as a teaching resource*

To start the discussion I asked the teachers of school A, who had done some cross-curricular work in the reserve before, why they would want to take pupils into the reserve. Teacher Alg felt that "what we teach them [the pupils] has got to be meaningful as a life experience for them". She agreed with an

earlier statement of mine that the teachers concentrate on teaching the pupils "loads of facts" with the result that "the children don't have the skills actually to go and apply that to life outside". School A takes its Std 6 pupils into the reserve to try and achieve that. The school regards its Std 6 programme as still in "its infancy" and has been working very much "on a sort of trial and error basis" using "stuff that we collected together, created together". Teacher A1g would like to obtain some feedback on their std 6 programme and would be more than happy for people to give constructive criticism on it. This was supported by teacher A3b and later during the interviews by teacher A2g.

● *Subjects that should be incorporated in the reserve*

Teacher A3b thought that "what we need first of all is a teacher orientation programme" as the teachers in the group all have something to offer and she would like to see not only Biology and Geography included, but also History. I then remarked that Biology and Geography had initially been chosen as they both have sections on ecology and that the syllabus was a good starting point. The group would also become very large if History was accommodated at that stage. It was envisaged that when the current group was functioning well other subject teachers could then join (refer section 6.1.1). The History aspect was again raised later during the first workshop by B5b when he mentioned that a History-Economic section could be combined at the old sandstone quarry site. The members of the group recognised that "the possibilities of the reserve were endless" and mentioned topics as wide ranging as soil types, soil erosion, soil erosion control, soil profiles, ecology, mammals, birds, insects, vegetation, plant invaders, fossils, bushman paintings, game farming, climate and mapwork that could be covered in the reserve (refer sections 4.3, 5.3.13 and 6.1.1).

- *Teacher orientation*

The group agreed that a teacher orientation for the group was needed and a lot of discussion throughout the workshop then focused on the form this orientation should take. Teacher B5b agreed with teacher A1g when he said that:

... maybe our starting point is that we must get out there together and we must each have our input and we can then sift out what can work because at the moment many of us are shooting in the dark, if we haven't been up there we are not quite sure what is to offer there.

This would be a good starting point as teacher E11g had never been to the reserve before (refer section 5.3.3).

Teacher A3b was the first teacher in the group that felt "we need to look at the vegetation much more closely". She showed the group examples of photocopies of plants that could be used for pupils to identify. She would also be prepared to try and catalogue the plants for the nature reserve. Teacher B5b saw that photocopies of plant invaders were included and that "there is quite a lot that we can do with just invaders, that is also an angle of Biology, that is part of the thing surely". Teacher A1g suggested that if the group went to the reserve we could perhaps do some practical hands-on work ourselves, starting by looking at the plants. Teacher B5b also suggested that if "hands-on" work was done with soil erosion in the reserve a study of plant succession could be done. The problem was however that "we don't have the knowledge of the plants, we need somebody to come in and say to us, this is a that and this is something else". Teacher A3b suggested that the group contact the extension officer as he had helped to identify plants for them before. Teacher A4b added that the extension officer should "be able to give us some information and possibly suggest reference books and things that would apply to the reserve". I suggested that when the group looked at grasses, the whole concept of game farming versus stock farming could be brought in. B5b added that the game was going to utilize a variety cross-section of plants. Teacher B5b remarked that somebody had been gathering bark, which he would imagine was for medicinal purposes, at

Waterkloof (site indicated on figure 1.1). He would very much like to have a "herbalist to come along there and tell me this tree is for this, or that plant is for that". Teacher A1g commented that they have had Cecil Nongwane (education officer at Albany museum, Grahamstown) with them at Thomas Baines who took them on a walk and identified the traditional uses of the valley bushveld and the trees. Perhaps school E could suggest somebody that could do something similar as "surely there must be somebody in the black community who could tell us". The group could then also get the scientific, English, Afrikaans and Xhosa names for the plants. Teacher B5b has found that when taking the boys out into the field they are more interested in the plants if you could tell them about the medicinal uses of the plants.

- *Knowledge*

Various members of the group voiced their doubts about working in the reserve as they felt they did not have the "background knowledge" that was needed. B5b was worried as "we don't have the knowledge about the plants" and felt that we needed somebody to come in that did have the knowledge. Teacher A1g agreed that knowledge was a problem but pointed out that when "we are not sure where to actually start with the thing [project] one kind of just puts it off and we just don't ever get started". Teacher C7b stated that

I can't see any use in us going out knowing that none of us is an expert in outdoor education, so we must get someone from the outside, someone to teach us.

The statement of teacher C7b that "none of us is an expert in outdoor education" caused some comment from teacher A4b who replied by saying:

We may not be experts but you probably know things that I don't know and I know things you don't know and at least if we go together we can decide which areas are good for a particular subject.

Teacher C7b continued that "every time we take someone along [to the reserve] we take notes, so we learn ourselves". To teacher C7b this would then be a "long-term investment". I

confirmed that it was a long-term project and that I hoped that later the group could work on other resources in the Queenstown area (refer section 6.2). However I did not agree with teacher C7b that the group did not know anything about outdoor education pointing out that "I think we will be surprised what we know". Teacher C7b was not so easily convinced and replied that he thought that "we are starting at zero point, nowhere, but every time we get in an expert your scope increases". Teacher A4b vehemently disagreed "that we are all at zero".

Teacher A3b suggested that each person could take notes on a certain aspect and then "they produce that little bit and share it with the rest of us".

- *Should somebody be invited to go with the group to the reserve?*

I then asked if they wanted to go to the reserve as a group and perhaps invite the extension officer and the herbalist to accompany them. Teacher B5b was not sure that experts should be invited at the beginning, asking "shouldn't we just go and have a preliminary look at the set-up?". Then the group could decide that they wanted to know more about a certain aspect and "then pull those people in". Teacher C8g objected as "that means we have to come back again, can't we just do it all in one?". I, supported by B5b, did not think that one afternoon would be enough to take various people into the reserve. Teacher A4b did not think that more than the nature conservation officer and the extension officer could be accommodated in an afternoon. Teacher A1g reasoned that if we took into account the aspect that would interest the pupils most we should ask in the herbalist first. Teacher A4b then pointed out that we first needed more knowledge about the plants before we could look at their medicinal value. It was then agreed that the group wanted to visit the reserve and then get in one expert at a time so that they could learn the maximum. Teacher A1g summarized that for the teacher orientation in the reserve "we should be looking at the global

aspect first and then we can decide after that where we want to put our focal points down". She felt that when the teachers had acquired the necessary skills and knowledge about one aspect they could then move onto the next aspect.

- *How were pupils going to be brought into the reserve?*

The group was not decided on how it was to involve the pupils in the reserve. School A suggested that there should be different stations in the reserve and that groups start at different points in the circle and then go on to a next point. This method had worked well with their Std 6 day in the reserve. Teacher B5b had a trail in mind but teacher A3b pointed out that "the trouble with a trail is that you can't take 70 children in one go". She reasoned that a trail such as teacher B5b had in mind "you can do with small parties, say club outings". Teacher A3b felt that the municipality should be approached to provide more ablution facilities and some kind of shelter. I suggested that the project should first be launched before the municipality was approached to provide amenities.

- *Suitable date to visit reserve for group orientation?*

After a lengthy discussion about possible dates for group to go into the reserve, the afternoon of Tuesday 26 April was decided on. Teacher A3b suggested the group started off with a good map for the reserve so that notes could be made on the map when various aspects were looked at. Teachers A1g and E11g supported the idea of the map and I undertook to draw a 1:10 000 map from the relevant ortophotos. I suggested that possible sites the group could visit on the afternoon they went into the reserve were Sunnyside, Waterkloof and the area near the reserve office (see figure 1.1). The nature conservation officer asked the researcher to confirm in writing, with the municipality, that the reserve could be used by the group. The aim of the visit would be merely to have a look at what there was with the nature conservation officer joining the group.

4.2.3 My personal overview of the first workshop

During the first workshop the participants from schools A and B were the main contributors. This could have been because these participants had actually done work in the reserve and that the workshop was conducted in English. English is their second language for participants from schools C, D and E. The teachers of schools A and B all knew each other and had worked together before. School C gave very limited input and school D no input at all. School E only contributed at the very end when teacher E11g stood up and said:

We have never done something of this nature so people, as time goes on maybe we will have some input, but we are listening with interest, so don't take it that we are not interested in partaking in discussions

Teacher E10b agreed with what E11g said and "was very much interested in seeing this project go on". He thought that the teachers of Queenstown need to share ideas as

what we are basically doing in the classroom is just theoretical knowledge and what I have discovered that as a biology teacher I need to orientate my kids with the environment which is basically the point of departure in the syllabus they are doing.

He would like to go to the reserve as "I know I'm going to learn a lot" and then he would be in a position to explain the things he has observed to his pupils.

The workshop had taken just over an hour and overall I experienced it as having been positive. Although I had tried to involve schools C, D and E in the discussion it had proved to be difficult. The fact that the nature conservation officer arrived 40 minutes late, due to commitments in the reserve, meant that decisions about what areas in the reserve could be visited could not be made initially. A lot of what had been discussed also had to be repeated for the benefit of the nature conservation officer. If I had used a flipchart a lot of repetition could have been avoided.

4.3 SECOND WORKSHOP

Three areas in the reserve, that had been discussed during the previous workshop, were visited on 26 April 1994. These areas, as indicated on figure 1.1, were Sunnyside, Waterkloof and the reserve office area. The workshop on each site has been fully written up.

4.3.1 Sunnyside

Sunnyside is a picnic area in the Longhill section of the nature reserve next to a small dam. This is the area in the reserve around which school A concentrate their activities when they have their std 6 day in the reserve. The following topics were discussed:

- *Vegetation*

At the dam teacher A3b explained how a transect study could be done by using quadrants. Three different types of vegetation are counted in each quadrant and a histogram is made of the findings. She explained that this was an exercise in quantitative biology as the pupils are actually counting and plotting. The group members thought that this would be an interesting exercise and asked teacher A3b various questions. Teacher A1g pointed out that if one looked towards the mountain from the dam area the ravines could be picked out by just looking at the vegetation. Teacher A3b noted that there was also dense vegetation below the run-off from the krantzes.

- *Soil erosion and siltation*

Teacher B5b stated that one could look at erosion and siltation by measuring the depth of water at the dam wall and then measuring the height of the dam wall. This dam had a high % of siltation. I added that building a dam is one way of solving an erosion problem but that there were risks involved as siltation occurs not only at the dam wall but also at the point of inflow into the dam and that water could then flow around the dam. This specific dam was also badly constructed as there is no cement overflow with the result that there is a lot of undercutting.

- *History*

Teacher A2g pointed out an old weir that was visible in the dam and thought that an historic perspective could be highlighted there. Teacher A1g then mentioned that Margo Muller, one of the scholars of school A, wanted to look at the history of the reserve for the young historians' conference (refer sections 5.3.11, 6.1.1 and 6.2).

The group then moved to the badly eroded area below the dam wall.

- *Rock types and soils*

Teacher A1g showed the group the different types of rock and let the group actually feel the different types of rocks and describe them. Teachers A1g and A2g then pointed out the different types of weathering, contact zones and jointing that were visible in the donga. A soil profile of the donga could also be drawn. The geography teachers from the other schools were very interested to see what could be done in such a small area.

- *History*

Of historical interest is the shale in which fossils occur. The nature conservation officer then told the group about the fossils that had been found in the reserve.

- *Soil erosion*

School B had done some erosion control in this area by placing lawn cuttings where sheet erosion was a problem and had found that the groundcover had improved.

4.3.2 Waterkloof

Waterkloof is a small, wooded kloof in the reserve where water can usually be found.

- *Water*

Teacher B5b takes his Std 8 Biology pupils to this spot to do a freshwater study where the plant and animal life of the water is studied.

- *History*

The historical aspect of this kloof was pointed out by B5b as

it was used as a shooting range during World War II.

- *Vegetation*

Teacher B5b also showed the group where bark had been stripped from the trees. It was likely that these trees were being harvested for traditional purposes. The group noted that the bark had only been removed from one side of the tree and speculated on why this had been done. This question would be brought up again when the herbalist accompanied the group (refer sections 5.2 and 6.1.1). Teacher B5b also stressed that the pupils should look at the plant life around them as there is something useful about every plant even the kakibush growing there. The kakibush is used as a base for perfume and B4b added that green kakibush also keeps bats out of the roof. There are also many aloes, which can be used for medicinal purposes in the area. The pupils could also be shown the prickly pear and then the question of controlling plant invaders could be raised by pointing out the cochineal beetle to them. The teachers from schools A and B commented that pupils are always interested to hear about the uses of plants.

The nature conservation officer had to leave the group at this stage as he was called out over the radio.

4.3.3 Reserve office area

- *Soil erosion*

The reserve office area is near the entrance of the Lawrence de Lange reserve and some work has been done to control soil erosion. I showed the group the two methods that had been used to combat soil erosion in the area. Where the branches of *Acacia karroo* had been spread sheet erosion had been stopped effectively but where the reed and stonewall combination had been used erosion was still taking place. It would be good to point out to the pupils that not all erosion control methods were effective. Teacher B5b added that it was difficult to get soil erosion under control as the ground being eroded needed to be covered.

4.3.4 Group discussion

After the three sites had been visited a discussion was held. All the group members agreed that the reserve had a lot of teaching potential. The group was still divided on the issue of how exactly it wanted to bring the pupils into the reserve. Teacher B5b still held his original idea of a trail with various stations, while teacher A1g quite liked the idea of a route march and teacher B3b would like them to start at different points in a circle and then to rotate.

Unfortunately teachers C7b, C8g and A4b had to leave the group at this stage as they had other appointments. The rest of the group then reached consensus that the next steps in the project should be:

- To do initial information and worksheets so that the group had something to work from in the reserve. The group was aiming to put together a package with background information which teachers could use and which would consist of worksheets/information sheets from all the different subjects. The teacher could then choose what was suitable for her/his standard. Each teacher agreed to work out worksheets on specific topics (see Appendix 4).
- The group wanted the herbalist to be brought in next.

4.3.5 Analysis of the workshop

It was difficult to analyze this type of workshop as the basic idea was to visit the reserve and to see what had been done and what could be done in certain areas of the reserve. As the workshop took place outdoors it was difficult to record as a tape-recorder could not be used. As this had been anticipated beforehand a scribe was brought in to take notes which proved to be a great help. It still took a long time to write up the workshop as the scribe had to be present to clarify the notes she had taken. When walking in the reserve the group tended to split up and various discussions would then take place at the same time which would be lost to the rest of the group and could also not be recorded.

4.3.6 My personal overview of the second workshop

Going to the reserve had been a good way for members of the group to get to know each other and group members could see in which field a specific person was interested. When it came to the allocation of worksheets, topics that were suggested by specific members by the group were accepted as it would be an area of interest to that person. The group members definitely knew more than they thought they would (refer sections 4.2.2 and 6.2). One of the reasons why they thought they lacked knowledge could have been the fact that they were moving from what had been "known" to them before to the "unknown". They were now constructing their own knowledge.

I found that the group was forming a group identity and that the project was now perceived as a group project and not as my project. Although it was intended that the group would be focusing on Biology and Geography aspects, History aspects were also being included. As teachers A1g and A2g were the senior History teachers at school A they recognised the historical potential of the different sites and pointed them out to the group.

I however felt that there had also been problems. Although everybody in the group could participate it seemed that the teachers from schools A and B were the only ones providing input. This also happened during the first workshop (refer section 4.2.3). Reasons for other participants not providing any input could have been that they had never done anything similar, were not prepared or confident enough to contribute, were not interested in some of the aspects or did not find it easy to contribute in English. I thought that the English members of the group felt that the Afrikaans members were not pulling their weight. As I am Afrikaans speaking I might have been oversensitive to the fact that the Afrikaans schools were not participating. I felt that the only way a good analysis of the workshop could be done was to follow it up with interviews to see how the group members felt about

certain aspects.

4.4 POST WORKSHOP INTERVIEWS

The teachers were interviewed at their homes and the interviews were conducted in Afrikaans or in English, depending on the home language of the interviewee.

4.4.1 Analysis of the interviews

Each interviewee was asked three questions (refer section 3.3). The questions will be looked at separately.

- *Question 1: What were the positive aspects about Tuesday's outing? What were the good ideas?*

What came out very strongly was that the project was considered worthwhile and that there was a lot of potential in this area. Teacher C8g said "Daar is geweldig baie idees, ontsettend baie positiewe moontlikhede" Two members of the group acknowledged that they had missed recognizing the potential of the reserve before. Teacher B5b said

I gained quite a considerable amount from the trip being familiarized with an area which I did know, but had not considered for educational purposes

The group members saw the relevance of the project and realized that they would gain from it. Two interviewees also commented on the fact that the outing had also been relevant to the syllabus. The interviewees also commented on the co-operation between the group members and their willingness to help. The Afrikaans members in the group were struck by "Die bereidheid van die Engelse groep om saam te werk" (D9g) and "Die gees wat daar tussen die ouens heers, hulle wil mekaar help" (C7b). Others were pleased that the Queenstown teachers were working together as a group. Teacher A2g said:

One of the best things that happened was that we finally got teachers from the Queenstown schools to sit down and do something on their own without having to be formally pushed into something via the teachers' centre.

The teachers also "seemed quite happy to talk about what they were doing, they weren't reticent to give their ideas" (A2g).

The people that had worked at upgrading the reserve were pleased that the teachers found that what they were doing interesting and worthwhile. Teacher A1g noticed that you could see by the reaction of people that just little things were helping them to see things in a way they hadn't seen it before.

There was also a lot of comment about the sites we had chosen for the workshop. The donga-area below the dam wall elicited the most response with three members saying that they had liked the ideas which were shared there and would definitely use them. "Ek het die donga die meeste geniet, dit het vir my baie nuwe idees gegee" (C8g) and D9g "die insette by die donga was baie positief". The fact that four of the six interviewees were Geography teachers probably contributed to the fact that most commented about the donga area which was most relevant to Geography. Teacher B5b liked the transect study at the dam and "will follow up the quadrant idea". Teacher A1g remarked that "the sites were very accessible which is a big plus".

The cross-curricular approach that we were adopting was also mentioned by A2g as being very important as

this is not just Geography or just Biology. I think the kids are seeing schools as compartments, we are all living in little boxes.

- *Question 2: What were the negative aspects about Tuesday's outing? What were we doing wrong?*

Nobody saw anything as a major problem but they did comment about different negative aspects. The English speaking members of the group felt that there could have been "more input apart from [school A's] people" (B2b) and the teachers from school A felt "frustrated as it seemed like there were just a handful of us who were contributing" (A1g). The teachers from school A then looked for a possible reason for this and thought "maybe they felt we were dominating the show because we've done something before" (A1g) or that outsiders were being brought into the reserve that they were not used to, "so we have to get over those attitudes, people have got

to get used to the fact that there are other people coming along" (A2g). Nobody mentioned that it was the Afrikaans speaking members that were not contributing which could mean that I was oversensitive to the Afrikaans versus English aspect or that the English teachers were just being polite/considerate. School A's teachers' understanding of why the others were not contributing was actually confirmed when D9g stated that he would have liked to contribute but "op daardie stadium was ek self nog nie werklik voorbereid gewees om 'n inset te kan lewer". The research participants seemed very perceptive of the needs of others in the group and this could have been because they really wanted this project to succeed. They were however critical of those teachers who had been invited and then had not made an effort to join the group. Teacher A2g thought that

We are not getting some other teachers willing to join in with us, because they're either scared we are going to 'steal' their ideas or maybe we are going to show them a better way of doing it. Some teachers are nervous to see what other teachers are doing in case that they are shown in a bad light.

Other negative aspects that were mentioned was that departure times had to be adhered to and that having the workshop the day before the elections had not been a good idea as that was probably the reason why school E could not join us.

One teacher was still not happy that the teachers had different ideas about how the pupils are to be brought in to the reserve as he said "dit moet eenvoudig begin waar groepe kan baat" (C8g). He would also like to have an expert brought in on the aspects we had already covered in the reserve to highlight important aspects and also to teach the teachers. It was evident that he felt knowledge resides with the experts. Teacher C7b felt that it was necessary to go back to the syllabus as comments had not been closely enough related to the syllabus, "gaan na die sillabus en kyk waar's die raakpunte, m.a.w. jy moet sillabusse inkorporeer in dit wat jy wil ontwikkel".

- *Question 3: What do you think needs more attention if we go out again, possibly with the herbalist?
How can what was done be improved on?*

The interviewees tended to answer questions 2 and 3 together as they indicated what they felt were problems and then gave their ideas of how to solve them. Two people suggested that the group could be split into separate Biology and Geography groups. I felt that would defeat the aim of the project as the whole idea was to develop the reserve from a cross-curricular perspective.

Three interviewees said that they would do the worksheets they had promised and might even do some more on topics they were interested in. Teacher B5b thought that

individuals should be contacted individually and asked to look at an aspect of their interest and put something together on that specific topic

and that more worksheets would then be done.

The research participants were excited about the idea of visiting the reserve with the herbalist. The teachers from school A had been out with a herbalist at Thomas Baines and teacher A2g stated that "going out with the herbalist is a most staggering experience". Teacher C7b suggested that the syllabus be consulted by the group and that specific questions for the herbalist be formulated. "M.a.w. jy kan nie daar kom met 'n probeer en tref metode en sê hier's die herbalist, hier's die gebied, vertel ons iets nie." Teacher A1g suggested that some kind of structure be created within the group, with the Biologists for example concentrating on the types of vegetation the herbalist talked about and the Geographers concentrating on the habitat. Then the group "can sit down together to create something" afterwards. It became evident again in answers to this question that the group members had expectations for the project and that they wanted it to succeed as they were going to benefit greatly from it. Teacher C8g said

die projek moet op die ou einde vir my iets, wat vir almal iets bied, die ou wat niks weet nie, die ou wat bietjie meer weet en selfs vir die kenner.

4.4.2 My personal overview of the post-workshop interviews

By interviewing the teachers I could get the views from those that had given input during the workshop in the reserve as well as those that hadn't. The teachers who had not given input had definite views about the project. Although I thought that the workshop in the reserve had not gone well, the interviewees actually thought that it had. As I was both the researcher and a member of the group, I found it difficult to be objective. I had wanted the workshop technique to succeed and consequently had very high expectations of the other group members.

4.5 SMALL GROUP DISCUSSIONS

I tried to get the group together during the last week of July or the first week of August but as no suitable time could be arranged for the whole group to meet, I saw individual teachers or small groups of teachers.

4.5.1 Schools A and B

The teachers from schools A and B met as a group. I mentioned the waterkits to them and they indicated that they did have waterkits at their schools but did not use them. They were enthusiastic about my suggestion that I ask Barry Irwin (a std 10 pupil from St. Andrew's College, Grahamstown, who had worked extensively with the waterkit) to come and demonstrate the kit to the group. They thought that even a large group of pupils could be involved in using waterkits (refer section 6.1.1). If running water was needed for these tests we could obtain some from the Komani river that flows through Queenstown (refer section 6.1.1).

After the first workshop teacher B5b had offered to arrange for a herbalist from the Queenstown area to go out with the group into the reserve. He reported to the group saying that the herbalist he had contacted was not prepared to help the group without being paid a fee. Making contact with the herbalist had been a long involved process. When he finally

made contact with the herbalist he was not sure that the herbalist understood what he wanted. The herbalist seemed to be more interested in finding out whether teacher B5b could find him premises in Queenstown. He indicated that he was not sure whether this herbalist was what the group had in mind. After discussion the group decided that Cecil Nongwane at the Albany museum should be asked if he knew of a herbalist. Cecil might even be able to come himself. I agreed that I would contact him as soon as I got back to Grahamstown.

Teacher A1g reported that Margo Muller had almost completed her research on the history of the reserve and that it promised to be a good project that the group would be able to use. I had previously written a letter to Margo after the workshop in the reserve stating that the group would be delighted if she would allow her research to be used once it was completed (refer section 6.1.1).

Another aspect that was discussed was the information and worksheets. The only sheets that had been completed were those that I had done on soil erosion and mapwork. After completion of these worksheets I had sent them to the teachers of schools A for comment who then passed them on to the other schools. Although the other schools had seen the worksheets only the research participants of school A had made additions and changes to the worksheets. I thought that the other schools did not add to the worksheets as they either did not go through them thoroughly or thought that I, as the researcher, should know how to do a worksheet and they felt they did not want to add. Throughout the research I found that the research participants of schools A and B would get involved wholeheartedly while the research participants of the others schools waited for me to give them direction.

Teacher A3b was working on a worksheet on grasses of the reserve but the others had not yet started on their worksheets

due to work pressure (refer section 5.3.10). At that stage they still intended doing the worksheets. The group also discussed what should be done with the information and worksheets that they had. Teacher Alg suggested that two files, one containing information on the topics and the other containing worksheets about the topics be created. The group could then add to these files on an ongoing basis.

4.5.2 Schools C, D and E

I spoke to the teachers of these schools individually. The teachers of schools C and D had also not got round to information or worksheets. Teacher C7b was eager to show me the waterkit and booklets he had received from Sharenet. He indicated that he would like to do a worksheet on the water of the reserve but would however like somebody to come and demonstrate the waterkit to him. He suggested that he and teacher B5b should meet to select some suitable sites for a water study. I could not see the teachers of school E as they were invigilating and marking exam papers.

4.5.3 My personal overview of the small group discussions

It was a pity that a workshop could not be arranged. It once again brought home the fact that one of the constraints of this research was the extra mural activities of the teachers which meant that a time for a workshop could not be found (refer section 3.4.2). I could detect that among some participants, interest in the project had waned which could have been due to the fact that the group had not met since April and that the group could not use the reserve as it had been closed for game capture and hunting (refer section 3.4.2). I was aware that what was done next would be very important for the continued interest in the project.

4.6 CONCLUSION

It had taken a lot of organization to initiate the project. I had not realized before that a great deal of detailed organization would have to take place throughout the project.

The diversity of research participants had to be taken into account if I wanted an effective working group. Not all the research participants were dedicated to the project to the same extent. The slow progress made on the worksheets made me realize that some decisions of the group were not going to be acted upon. It was a pity that the teachers of school F dropped out of the study and I would have to be very careful that the teachers from school E did not do the same as they could not attend the second workshop and the small group discussion. The splitting of the group for the small group discussion had been problematic as I wanted to keep the group together but also realized that schools A and B formed a very effective working unit on their own.

Although I had tried to emphasize the scope of environmental education the group members were focusing on the biophysical aspect of the environment. Knowledge was generally seen as being part of the syllabus and textbooks and as belonging to the experts (see however section 6.2). The group wanted to bring in outside experts so that they could learn from them.

CHAPTER 5

COLLECTING DATA: FINAL STAGES

5.1 INTRODUCTION

The third workshop was held in the nature reserve on Monday afternoon 22 August. Cecil Nongwane, an education officer of the Albany museum in Grahamstown and Barry Irwin, a std 10 pupil from St. Andrew's College, travelled to Queenstown to attend the workshop. During the morning the researcher, Cecil and Barry looked at various sites in the nature reserve and identified two areas where Cecil could talk to the group about the traditional uses of the plants. Group members of all the participating schools attended the workshop (refer table 3.2). The workshop was held in the afternoon and the Science teacher of school C joined the group as she was interested in hearing more about the waterkit that Barry had come to demonstrate.

5.2 THIRD WORKSHOP

When the group met that afternoon they first went to Tiffin kloof (see figure 1.1) where Cecil showed them various plants and explained the traditional Xhosa uses of these plants. The group members were very interested throughout and asked many questions. The teachers from school E added information and helped the other group members with the spelling and pronunciation of the Xhosa words. The teachers of school E now felt confident enough to take part which was an interesting development in comparison with their earlier reticence at the first workshop (refer section 4.2.3).

After studying the vegetation at Tiffin kloof the group went across to Waterkloof (see figure 1.1). This is the kloof the group had visited during the previous workshop (refer section 4.3.2). Here the group specifically wanted to know why bark had been gathered from the trees. Cecil confirmed that bark from these trees is used by the Xhosa people, but for cosmetic reasons and not medicinal purposes as the group had thought.

Teacher A3b collected plant material from most of the trees and shrubs that Cecil spoke about with the aim of obtaining the scientific names of the specimens (refer section 6.1.1).

After Waterkloof the group went back to the picnic site at Sunnyside (see figure 1.1) where Barry Irwin demonstrated the use of the waterkit to them. Earlier that day he had collected water from the Komani river, near a squatter settlement in Queenstown, at my suggestion. He tested this sample of water as well as a sample of water from the reserve.

5.3 INTERVIEWS

As this had been the last workshop for the year I wanted to interview the research participants about the workshop as well as the whole process that had taken place through the year. As all the group members were not available for interviews the following day I split the group into three for interviews. The teachers from school E were interviewed directly after the workshop. As these teachers had missed the second workshop and I had not seen them since the first workshop, I wanted to interview them separately as some of the questions would have to be modified. The teachers of schools A and B would also not be available the following day and suggested that they be interviewed that evening. As these teachers had contributed the most to the workshops during the year and were English-speaking it seemed a good idea to interview them together. When with the rest of the group they also tended to dominate as they were the group that had previous experience in cross-curricular work and had worked in the reserve prior to this project. Schools C and D were interviewed the following day. As the teachers of these two schools are Afrikaans-speaking the interviews were conducted in Afrikaans.

Only one question directly referred to the third workshop that had been held in the reserve.

5.3.1 To what extent have Cecil and Barry broadened our understanding of the reserve as a resource?

Much of the response applied to what Cecil had told the group about the different uses of the plants. This could have been because the group had been looking at the plant aspect of the reserve from the beginning and had some unanswered questions they wanted to ask. Further he was a very entertaining speaker and school A knew him as they had previously worked with him. The group spent the most time with Cecil during the third workshop.

The teachers from schools A and B had also benefitted from going into the reserve with Cecil. To this question teacher A1g replied that "I think Cecil is just marvellous the way he walks along with you and explains things". These teachers were also glad that the teachers from school E were there so that they could see what Cecil was doing. They believed that the teachers from school E could do a lot of what Cecil had done. I pointed out that the group members had held a different concept of experts, where experts had been seen as people that knew a lot more than the group members. Teacher A3b pointed out that teachers were often scared to say what they actually do know as they do not consider themselves experts. Teacher B5b felt that the group was succeeding as various teachers had contributed by adding something to what Cecil said. Teacher A1g thought that "we should all pool our little bit" as within the group tremendous resources existed.

The teachers from schools C and D were not as positive about the outing with Cecil. Teacher C8g felt strongly that "ek dink nie dit was die moeite werd gewees nie" as he thought that it did not tie in with the pupils' schoolwork. It could be that he saw knowledge residing with the textbook and syllabus. When teacher C8g answered later questions he tended to contradict this statement. Teacher C7b did not see it as irrelevant but felt that "die aanvanklike beginpunt moet nogsteeds die feite kennis bly wat uiteindelik aansluit by die

syllabus" and thought that what Cecil had done could be regarded as a "kultuurgedagte" that should be added for interest' sake.

Teacher D9g could see the relevance from a historical or anthropological viewpoint. He thought that it also depended on the nature of the classgroup. If there were black pupils in the class then it would be relevant but he did not see it as being relevant to the white pupils of their school. It is possible that he thought this way as he has never taught black pupils and did not see indigenous knowledge as being important. This was notwithstanding the fact that teacher B5b had told the group during the second workshop (refer section 4.2.2) how interested his pupils (who were also white) were in the medicinal value of plants.

The teachers from schools C and D seemed to be disappointed as they had different expectations from people they believed were experts. They wanted more facts that could be directly related to the syllabus. These teachers were still very syllabus and textbook bound. In my interaction with teachers in Queenstown I have found that many teachers feel that knowledge is absolute and cannot be challenged. Knowledge is seen as being "out there" and having to be obtained. Saying that it was not relevant as they did not have black pupils in their classes suggested a lack of vision as they could have pupils from different cultures in their classes within the next few years.

School E thought that meeting and listening to Cecil had helped them a lot. For them he had highlighted quite a number of aspects in their own culture.

Now some of the trees we simply took them for granted, we did not know the details about them, only to find that when the gentleman spoke about these plants, these are the plants that we often see people using. We were just not aware of them and would never bother ourselves by asking the people particularly during rituals, religious rituals, we would never ask, would never query why are you using

this instead of that? So I think we have gained a lot. (E10b)

Teacher E10b now felt confident that they could expand on what Cecil had done.

The teachers from school E did not realize that they did in fact have some knowledge about the plants in the reserve. This was also true of the other teachers in the group. The reason for this could be that in the South African school context, knowledge is seen as " a realm of objective facts ... not something to be questioned, analyzed, negotiated instead something to be managed and mastered" (Giroux 1988:14). This type of knowledge has emphasized facts at the expense of concepts, values and attitudes.

This knowledge, that Mtshali (1994) refers to as the 'indigenous knowledge', of the black community has not been given credibility within the present syllabuses. The authoritarian education structures did not encourage teachers to question critically. The teachers do not realize that knowledge can be challenged, that knowledge is not absolute, not hierarchial but that knowledge is a "human construction" (Guba & Lincoln 1989). All knowledge is socially constructed as knowledge cannot exist in a social vacuum. Knowledge relates to the people who have constructed it and the circumstances, such as historical, political and social, in which it has been constructed. When people start interacting with one another this perspective of knowledge that has been entrenched in the philosophy of the school system begins to be broken down and then reconstruction of knowledge can begin which is an ongoing process. Despite the entrenchment, some of the group members were beginning, even if very tentatively, to reconstruct their perspective of knowledge.

The comments about how useful the waterkit was for use in the reserve also varied.

The teachers from school A would like to try out some aspects of the beginner waterkit in their std 6 outing. Teacher B5b

did not think that he would use it with a group but that "it is fine for a guy to do as a project who is keen on that aspect". Teacher C8g found it "geweldig interessant dat 'n mens sulke baie dinge kan doen" and that "dit kan baie leersaam wees, baie meer prakties as wat Cecil vir ons gegee het".

The teachers from school E thought that bringing in water was very important as water daily influences peoples' lives. They were impressed by the fact that Barry had collected a water sample from the squatter settlement to compare with the water in the reserve. They thought that there should be a person like him at the municipality that took an interest in monitoring the water quality in and around the black townships. They felt that "we need that knowledge about these tests" but that the tests were difficult to understand. Teacher E10b suggested that one test at a time should be mastered. A person who has then mastered a specific test could then teach the next person. The teachers from school E wanted to master these tests as to them it could mean an improvement in their quality of life in the black townships. The other schools' teachers regarded it more as an useful exercise that could be done. The tests were perceived as being difficult to do as Barry demonstrated the waterkit using both the beginner and advanced kits. As he is a proficient user of these kits and had little time to demonstrate in, it was perceived as being difficult. If perhaps he had had the whole afternoon to work with the group and demonstrated only the beginner waterkit, with the group members participating, they might not have perceived it as being so difficult.

After interviewing the project members about the third workshop I focused attention on the project as a whole. With these debriefing interviews (refer section 3.3) I aimed to evaluate the progress of the project.

At the first workshop (refer sections 4.1.2 and 4.2.2) the research participants mentioned a lack of knowledge, a lack of skills and a lack of expertise as reasons why they were not using the reserve. I wanted to find out whether this had changed and asked the following question:

5.3.2 What do you feel you have learnt from the process in terms of knowledge, skills and expertise?

The teachers from schools A and B agreed that they had most definitely gained in terms of knowledge, skills and expertise. Teacher A1g pointed out that it had to be realized that the process was ongoing. They would start with their std 6 programme where they intend to build on what they had done in the group in the reserve. Teacher A3b stressed that what the group had done had to be written down, maybe in the form of a booklet, so that it would be available to everybody. This was the first time that a booklet was suggested. This would be an information booklet that could be used by the schools as well as by members of the public that visit the reserve. I thought that it would be a very good idea and would tie in with the management plans of the nature conservation officer. The pupils could also contribute to this booklet with a teacher then doing the final editing (refer section 6.1.1).

Teachers C8g and D9g felt that they had definitely learnt from the process in terms of knowledge, skills and expertise. Teacher D9g critically reflected on this question and felt that

Ek is te teoreties betrokke met my kinders, ek moet 'n bietjie uitbeweeg. ... dit het my weereens daarop gewys dat ek moet uit die klaskamer, die probleem is net tyd.

The teachers are misusing the word "teorie" as they refer to syllabus content and textbook information when they use it. In my experience this is however a widely held position, especially in the Afrikaans speaking schools.

Teacher C7b thought that the question should be rephrased as he did not think one should see it as acquisition of more

knowledge but rather a change in the group's perspective.

... ek wil dit ook nie sien uit die punt dat jy besonder baie kennis opgedoen het nie, ek wil dit eerder sien uit die punt van dat ons het ons perspektief verander, m.a.w. wat ons nou gaan kyk het, het ons nou eintlik moontlikhede blootgelê, wat kan ek met kinders gaan doen.

It was not clear exactly how teacher C7b had changed his perspective. It could be that he had changed his perspective about bringing in 'experts' from outside. His expectations might have been to acquire more information but now he realized that there were other aspects to the project such as reformulating the view he held about knowledge.

The teachers from school E thought that they could contribute to developments in the reserve but had a problem as they did not know what was available in the reserve. This was because they could not attend the second workshop (refer section 4.3) that specifically set out to determine the teaching potential of the reserve. Teacher E10b reasoned that if knowledge about a certain aspect, for example plants is not utilized it becomes "stale". This had been happening to them as they did not have the opportunity to get out and visit places. I took this to mean the indigenous knowledge that they had about the plants of the reserve. The current school system does not encourage the use of indigenous knowledge.

By taking part in the development of the reserve they felt they were using their existing knowledge and acquiring more knowledge.

5.3.3 Do you think that, at this stage of the process, you have a better grasp of the reserve as a teaching resource?

In retrospect this was a slightly leading question as it could lead to positive answers. At the time I held the interviews I did not realize this. It might have biased the answers nevertheless I present them at face value. As I knew most of the research participants they did not need to impress me by giving positive answers. It could have been that as I was

part of the process I tended to ask questions that would lead to positive answers. A more neutral question would have been: Did your grasp of the process change?

This reconfirmed my view (refer chapter 1), as well as the view of the rest of the group members that had attended the second workshop in the reserve (refer section 4.3.4), that the reserve had a lot of teaching potential.

The teachers from schools A and B unanimously agreed that they had a better grasp of the reserve as a teaching resource. "Yes, certainly from the botanical side, yes" (B5b). Although they now knew more they still felt that the group had "only scratched the surface" (A1g) and that they, on their own, "have not done as much as we should have done" (A3b) as their extra-mural programmes were overloaded. I thought that this was a valid claim as they have extra-mural activities every afternoon as well as weekends. They felt that we should concentrate on the Longhill section as the white rhino in the Lawrence de Lange section would restrict the group (refer section 6.1.2). The pupils could however be taken to the Lawrence de Lange side for a specific reason.

Schools C and D also felt that the reserve has a lot of potential.

Op die stadium weet ons nog min, maar ons besef nou hoe baie kan die ding werklik vir ons beteken, dit wat ons nou weet is baie meer as wat ons geweet het maar daar is werklik nog baie geleenthede. (C8g)

Teacher C7b admitted that in the beginning he had not thought that this project would take a year but now he thought that "hierdie ding moet baie jare aangaan". Teacher D9g agreed that this was just the starting point and that as the project continued perspectives would broaden. If the knowledge gained through the process was applied, perspective would be broadened. He was sorry that he hadn't taken his camera so that he could have a photographic record for his own use. He further suggested that the Geography or Biology group of

teachers should get together more often so that they could exchange ideas so that information of the reserve could be brought back to the classroom. In reply to teacher D9g's suggestion that there should be an exchange of ideas teacher C7b felt that an information bank should first be built up. The pupils should do projects and then exchange ideas on what had been done. According to this, needs could then be determined.

The researcher did not ask this question of school E as they had not been to the workshop in the reserve where the teaching potential of the reserve had been assessed. I could however deduce from our conversation that they had seen the potential of the reserve. Teacher E11g told me that although he had lived in Queenstown for 30 years he had never been to the reserve before and thought that the reserve had a lot of Geography potential.

5.3.4 Would you be more confident now to mount an outdoor lesson?

I asked this question as one of the reasons that was cited during the first interview for the reserve not being used, was that some of the participants lacked the confidence to mount an outdoor lesson (refer section 4.2.2). I wanted to know whether this had changed as the project developed through the year.

The teachers of school A would go out to the reserve more than they had before if they could get over the logistical problem of transport. They wanted to be able to go to the reserve for just a period but periods were too short and classes were of such a size that it would be necessary to make two trips to get the pupils to the reserve. Teacher B5b felt that there was a limit on how often the reserve could be visited and did not think that he would go out more often. He already went out with his classes several times a year. He said that he would include more aspects when he did visit the reserve.

The teachers from school C felt more confident as the people who had come to the reserve had talked about many things that they already knew about. This confirmed my view that the group members saw people coming in from outside as experts that owned knowledge that they didn't have.

The teachers from school E felt that previously they would not have known what to do outdoors. They could have perhaps told their pupils the names of plants but not much more.

You know I think now I have got enough knowledge, I have got new ideas, I know what to look for. (E10b)

Teacher E11g agreed that he now felt confident enough to take his pupils out to look at the vegetation types and how these are influenced by the direction which the mountain slope faces.

I found it encouraging that after just one outing to the reserve the teachers from school E felt that they were confident enough to take pupils into the reserve (refer to section 6.1.1). Teachers are not confident to mount outdoor lessons either because they are not exposed to this aspect of teaching during teacher-training or receive no professional development opportunities in the presentation of outdoor lessons. This results in teachers staying in their classrooms where they feel they are in control. However by going into the reserve with other teachers confidence is built and ideas exchanged. After seeing Cecil Nonqwane talk about plants that they also knew about they realized that there is a place for indigenous knowledge and that textbook knowledge is not absolute.

5.3.5 What have you gained in terms of subject area?

The teachers of schools A and B agreed that many pupils regarded the fieldtrip as just an excuse to be out of the classroom and that could be a problem. They felt that work that was done in the reserve should form a part of the exam. They thought that if questions on outings to the reserve were asked in exams, the pupils would regard these outings as part

of schoolwork. This is a reflection of the present school system in South Africa which is very much exam driven.

The teachers of school A would like to do a trial run in the reserve with the beginner waterkit. The teacher from school B agreed with school A that if they used the waterkit "it has to be more basic" than the tests that Barry Irwin had demonstrated. This would mean that the beginner waterkit was to be used. Teacher A3b felt that we needed to look at water and as Biology is a science, measurement could be brought in. Data is seen by teacher A3b as an important base for Biology as well as Geography. Teacher A3b suggested that the pupils could be taught how to gather data themselves in the nature reserve or the data could be given to them and they could then draw conclusions from it. A trial run could be done when they have their Std 6 day in the reserve. For teacher A2g water would be the ideal cross-curricular topic as the biologists could work out how badly polluted the water is, possibly looking at volume and measurements. The geographers' point of view would then be to find out why it is polluted and what could be done about it (refer section 6.1.1).

Teacher D9g felt that he could now move out to the reserve to do some work there but still had a problem as he has to integrate what the group has done into the syllabus. He pointed out that in Geography there are limitations as the reserve can only be used for certain sections of the syllabus. He also has to do the theory in the classroom which takes a long time. I took it that by theory he meant the syllabus content (refer section 5.3.2).

Teacher C8g pointed out that the advantage is that now there is a place that can be visited and where Geography can be studied in practice. Having people come in means ideas that are gathered in the process that had not previously been thought about. This seemed to be a contradiction of an earlier statement where he did not think that bringing in

Cecil Nonqwanwe and Barry Irwin had been worthwhile (refer section 5.3.1). He could have meant people other than Cecil and Barry whom he would have thought more relevant.

To teacher C7b the gathering of knowledge had at this stage not been the important aspect.

... ek sou sê op hierdie stadium is die belangrike ding dat 'n ou kon gaan kyk het en kon gesien het dat die moontlikhede daar is en as jy besef dat die moontlikhede daar is dan beteken dit dat die eie inisiatief gaan nou 'n rol begin speel, wat op die einde van die dag die kind gaan bevoordeel.

To him it had been encouraging that the possibilities had been highlighted, that there had been contact with the other teachers and that people from outside had been brought in.

Working with a Geography and Biology subject group was regarded as a good idea by school E. The two teachers from school E suggested at their school that Biology students should also take Geography as the two subjects complimented each other. Teacher E10b stated that the pupils should take subjects that mean something and "lead somewhere".

5.3.6 Have you, as an individual, gained by being part of this group?

To teacher A1g "It has opened up a whole lot more possibilities" and she would like to work with teacher A2g and build on what had been started. For teacher A2g it was now much easier to approach the other teachers that had been part of the group. He felt that if he now approached a teacher that was part of the group the teacher would know what was being sought and would share and request information. This "makes it a much more personal and a professional approach". Having had a "third party" like Cecil Nonqwane and Barry Irwin coming in had given the project more momentum.

The view of teacher B5b was that

I have certainly gained from particularly this afternoon with having Cecil here because I am particularly interested with what he was doing.

He added that having a person like Cecil made one realise that one did actually know something. Although he could read it up he would like to have a person come in to do the grasses as he felt more is gained when the person is working directly in a certain area.

When I asked teacher A3b if she had gained as an individual she replied:

- Oh yes I have definitely gained by just being with other people and looking at the area in a slightly different way from the way I look at it. You can't help doing that by being with people in other disciplines.

She agreed with B5b that the group needed "expert opinion" as we could use at least part of what those experts told us.

Teacher C7b thought that I should rather have asked whether the project would have been done individually if there hadn't been a group initiative. To him the important thing had been that the needs of the other teachers were the same as his needs. He liked the fact that the teachers were making contact as there hadn't been any contact among the teachers before this project.

Teacher E11g was "shocked to discover that these trees that we know can best be explained by white people in some cases". He was referring to the fact that teacher B5b, who is a keen naturalist, knew about some of the traditional uses of the plants. It appeared that teacher E11g felt that indigenous knowledge belonged to the black people and that he should have been able to explain about the trees as he had grown up with these trees and their traditional uses. This highlighted the fact that there has been very little cross-cultural contact between teachers before and that preconceived ideas are often wrong.

Before this project the teachers had had little experience or confidence in working co-operatively with others in a small group. To schools C, D and E the experience of being involved

in such a process meant a lot.

5.3.7 How worthwhile has working on this project as a group been?

The teachers of schools A and B agreed that working as a group had been a good idea. Teacher A2g thought that what made it a good idea was that it was a cross cultural group. Teacher B5b noted that it made a difference to school E when Cecil Nonqwane was brought in. Cecil was seen as an expert by the whole group and "being involved and having an African coming in made a big difference to them [school E]".

Teacher B5b then raised an issue that was discussed at length by the group. This related to school C who "did not contribute as much as I would like them to and communicate to us" although he was sure that they could contribute. Teacher A3b agreed as "we didn't actually gain anything from them, I didn't, because they didn't actually contribute anything". Teacher A3b suggested that it could have been the language barrier. This was not seen as an acceptable reason by the rest of the group as they didn't think language should be an issue. They felt school C could have contributed in Afrikaans as "nothing is going to overcome the barrier faster than when we muddle along in each other's language" (A2g).

As the workshops were conducted in English it wasn't a problem to schools A and B but if the workshops had been conducted in Afrikaans they could have found it a problem as some of the teachers in the group could not understand Afrikaans.

Teacher A2g pointed out that the group had to remember that schools A and B have a lot of contact with each other while they have had almost no contact with schools C and D. He thought that "they actually feel a bit of a distance from us because we speak a different language". He was positive that the communication problem could be overcome as "we are teaching exactly the same subjects and we are going to use the same ground". Throughout the project teacher A2g was positive that differences could and should be bridged (refer

section 6.1.1).

Teacher C7b felt "'n groep se inisiatief maak 'n ou dadelik deel van so 'n projek" and that they would not have been so motivated if they had been on their own. He thought that the group could be split into Biology and Geography sections on occasions. Teacher D9g felt that it was "tog nodig dat ons wel oor vakgrense heen moet werk om 'n breër perspektief daar te sien".

The teachers from school E were full of praise for the group. Teacher E10b was sure that "we wouldn't have done what we have done the way we have done if we were just by ourselves". He felt that they had learnt a lot by being part of the group. The group made them participate as they asked specific questions which needed exact answers. Teacher E11g added that much more information was obtained working together as one would say what tree it was and another could then tell the group about the uses of the tree. Teacher E10b was glad that they could contribute to the group as they could give the teachers the Xhosa names and spelling and he was confident that the white teachers would do further research about the plants.

Due to the political situation prior to the 1994 elections the teachers from school E had been working more in isolation than the other teachers in the group and they particularly felt that they had gained a lot from being part of a group.

5.3.8 Has the project been worthwhile?

All the schools agreed that the project had been worthwhile. Teacher D9g thought that this project had been a good starting point while teacher A3b was pleased that "you [I as the researcher] have 'forced' us to think a bit more about what the area has to offer and how to actually use it".

5.3.9 What has made it worthwhile? What have been the strengths/highlights?

For schools A and B the highlight had been the contact that was made with Cecil Nongwane and what they learnt from him. For school C it had been "die skakeling wat jy in die verlede nooit gehad het, die feit dat die skole nou vrymoedig mekaar skakel" (C7b). It had been encouraging for him to see that the other teachers had the same problems as he had and that people from outside could be consulted. The project had opened up possibilities for him "die moontlikhede wat 'n ou nou raakgesien het wat ek nie verlede jaar van geweet het nie". The teacher from school D agreed with what the teacher from school C said. School E found it worthwhile as "we'll gain a lot from these people" and they "got new ideas".

5.3.10 What have been the problems/weaknesses?

Except for what was perceived as a language problem by the participants from schools A and B (refer section 5.3.7) they did not think that there had been what could be termed "serious problems". The teachers from schools A and B felt that they had let the project down as they "have not sat down and worked on their worksheets" (A1g). Teacher C7b did not think that there had been problems. However he suggested that when in future people are invited to help better guidelines must be given so that they knew which standard was to be taken into the reserve. Perhaps a copy of the relevant syllabus could be sent to them. I felt that teacher C7b still regarded the syllabus as being the teaching guideline and anything that did not tie in directly with the syllabus was seen as not being relevant (refer section 5.3.1).

I did not ask this question to the teachers of school E as they had missed out on the second workshop as well as the small group discussions.

5.3.11 What about teaching materials?

The researcher told the respective groups that at that stage the idea was that there were going to be two files, one being an information file on various topics and the other a file of worksheets. A mapwork worksheet as well as information sheets on the grasses of the reserve and soil erosion had been completed. Teachers from school A and B felt that it was a good idea to then use the worksheets or part of them and then add or adjust them to specific needs. Teacher A3b still wanted to see a History input. Teacher A1g replied that a History aspect was being done by a std 9 pupil, Margo Muller of school A (refer section 6.1.1).

Throughout the project I found that school A had very definite ideas of what they wanted to have included in the project. Using their own initiative they had started working on the historical aspect of the reserve.

School C thought that developing teaching materials was very important as "op die ou einde gaan die sukses van die ding afhang van die inligting wat daar is" (C8g). He felt that this system would only work if individuals in the group not only took from the files but also gave input. I stressed that worksheets in the files should not be seen as prescriptive. There would be something on a topic and the teachers themselves could then modify it for their own use. It would however only work if the group was committed to place information in the files.

At that stage of the project some members of the group seemed to feel that the development of the reserve as a teaching resource depended on obtaining more information about the reserve. Information was still regarded as essential knowledge. I found that they kept on coming back to the point that knowledge equals facts.

5.3.12 Do you think the project has changed your view of environmental education?

I asked this question as I thought that their concept of environmental education had not changed much as they as a group still concentrated on education **about** and **through** the environment. To many teachers in the group the term environmental education had been a new concept before this project. It is probable that the group members did not really understand this concept as I had not workshopped this concept with them (refer section 4.2.1).

The teachers from schools A and B did not think that their views had changed but that the project "has reinforced it". "The more you do it [environmental education] and get involved, the more actual and beneficial it becomes" (A2g). He also pointed out that this was the third attempt to get some environmental education going in the reserve. The previous two attempts had been initiated by nature conservation officers of the reserve who had wanted to involve teachers and some members of the public. The reasons these attempts had failed could have been that the nature conservation officers "didn't have the insights and knowledge of education to know what to do" (A2g). I thought that what made this project different was that the initiative came from the teachers' side and that teachers involved seemed committed to the idea of the project.

Teacher C8g did not think that his view had changed, "miskien net sekere dinge bevestig en beklemtoon wat deel van ons is, miskien moet ons besef dat ons dit deel van die kinders ook moet maak". Teacher D9g agreed that his perspective had not changed, "net onderstreep dat dit 'n tema is wat noodsaaklik is en wat jy moet hanteer met die kinders".

These responses made me realize that I would have to workshop the whole environmental education concept with the group in the future. At that stage they did not realize that the term

'environment' included economical, political, social and ethical aspects. I would need to begin simply so as to get different aspects across.

School E did not really answer the question as they just spoke about the environment and not the educational aspect.

Teacher E11g was pleased to see that the municipality was protecting that specific area as elsewhere in the area the trees had been destroyed. To him the project invoked a sense of being responsible. Teacher E10b thought that the black people were not interested in the nature reserve as they had not been to the reserve before.

5.3.13 What do we hope to achieve in the long term?

What should we do next?

Teacher B5b felt that the long-term goal was:

You want to bring the kid into contact with the environment around him, where so many kids are totally cut off from it, particularly the township kid. I would imagine they are cut off from the natural environment and we are bringing them back to the natural environment.

Teacher A1g wanted the fieldtrip to be a more relevant part of the work. Teacher A3b added that as the environment is cross-curricular "you have got to look at it from several sides". She further added that "we can't afford to go to places like Thomas Baines and Boknes" and being involved in this project "I think that it has opened our eyes a bit more to what our own nature reserve has to offer". Teacher C7b agreed that he did not want to feel it necessary

dat ek my kinders op 'n bus moet laai en 400km verder gaan aflai om iets te sien nie. Die belangrike ding is dat alles wat 'n mens wil sien in Queenstown beskikbaar is. Wanneer jy 'n kind leer oor die omgewing is dit soveel beter as jy hom vertrou maak met die omgewing waarin hy bekend is. Dis vir my van baie groter waarde om hier uit te gaan en vir hom 'm plant te wys, die plant waarmee hy groot word, so hou die kind in die bekende omgewing en leer hom van die omgewing waarin hy groot word.

At the beginning of the project the value of local studies had not been recognized by all the members of the group. Although there is a whole body of theory on how to utilize the local area none of it seems to have filtered through to the teachers in the group. It could be that the teachers are so caught up with their day to day teaching activities that they do not have time or do not make time to read journals and books on relevant topics. The relevant journals and books are also not always available in Queenstown. Through the research process I am trying to introduce teachers to the whole body of theory on studying the local area.

The teachers from school E felt that the project was now at a stage where

... it goes now beyond this situation that we organised, that is a learning situation, it goes to a situation now where we will have to accept one another in this area as educated people of this area, having a common goal, that of sharing our knowledge and that of imparting our knowledge to the students. (E11g)

The group still had a lot of ideas that they would like to see implemented in the nature reserve. Schools A and B had the most suggestions. They would like to see a mathematical aspect brought in. Teacher B5b would like to see accounting brought in as you could get the town treasurer to tell you what it cost to run the game reserve, where the money came from, what they sold, what the game was worth etc. Teacher A3b felt that the economic side had to be brought in to promote that kind of landuse, "we have got to show that it is worth setting aside an area like that". Teacher B5b added that the aspect of professional hunting could then be covered and suggested the names of people that we could invite out to the reserve for this purpose. These people should talk to the pupils in the nature reserve itself as they are going to come across better there than in a classroom.

In most of the suggestions the emphasis was still on gathering additional information which is not of much value unless it is

placed in the context of understanding. I would have liked the teachers in the group to include more thinking skills, life skills, the ability to deal with the reality of the world. I could however already see a slight shift by group members, especially school A and B, in this direction. Although the biophysical dimension of the environment is important the political, social, economic and ethical dimensions must be emphasised. When pupils are taken into the reserve the purpose should be to provide them with insights that will later help them in decision making processes, enable them to manage their lives and understand how other people manage their lives. In a project such as this it would however take time before teachers recognize and accept that more than just information about a certain subject is needed.

Teacher A3b suggested that if game was to be looked at, black culture could be incorporated as had been done with the plants. Teacher A2g thought that as a lot of their black pupils come from the cities

their parents I could imagine, would be quite enthusiastic about any educational programme which reinforces their culture, so that they don't have any chance of losing it.

The teachers from schools A and B also wanted to know more about the birds, grasses, bushman paintings and fossils in the reserve. Teacher A1g then pointed out that using the skills of teachers A2g and B5b, who are excellent photographers and experts in their own right, had been overlooked. She thought "the possibilities are endless" for slide topics as a slide selection could be built up which included plants, animals, birds and the erosion sites.

The group had been so involved with bringing in people from outside that the people with expertise in the group had been overlooked. This could have been as previously it was thought that "experts" were the people such as Cecil Nonqwanwe and Barry Irwin that were brought in from outside. Teacher B5b thought it was a good idea as "that is an interest of mine, I

am prepared to do something like that".

Teacher C7b agreed that the more people that could be included the better it would be. Questions are going to arise from projects done by pupils in the reserve and then this would determine who would be brought in from outside,

Al hoe jy jou behoeftes gaan bepaal is deur die kinders werklik die geleentheid te gee om in die plek te werk en uit die probleme daaruit gaan jy bepaal watter ouens van buite gaan jy nodig kry. (B7b)

The teachers from school A wanted to include aspects of what Cecil and Barry had done in their std 6 day in the reserve later in the year. They thought that perhaps they could get the teachers from school E to come and help them (refer section 6.1.1). By bringing in the teachers from school E they would then be using the expertise that is available in the group. This seemed a good idea to me as group members would then be involved in helping with groups from the other schools which would strengthen the group project.

Teacher E10b now wanted to involve the other Biology teachers at his school in the project (refer section 6.1.1) and teacher E11g suggested that his sister, who is a herbalist, could be brought in.

The teachers from school A and B suggested that we brought some sort of pressure be brought to bear on the municipality for more facilities at Sunnyside. The facilities suggested were toilet facilities and some kind of 'lapa' that would provide shade and tables to work at (refer section 6.1.1). Teacher B5b pointed out that before the municipality was likely to do anything they would have to see that group members were actually making use of the reserve, "we have got to show them that we are serious".

As I wanted to know how the group members evaluated me, two questions were included about my role.

5.3.14 How would you evaluate the role I played in the process?

The teachers from schools A and B saw me as the "catalyst" (B5b) and when the researcher asked them whether she had been too pushy replied that "yes, you have been pushy but if you hadn't pushed us nothing would have happened" (A1g). Teacher A2g thought that

You could have been more pushy. I think we realise what the whole thing is about, we don't just see it as you pushing for something, we actually know what you want, we actually appreciate what you want. Therefore we go with it.

The teachers from school C and D agreed that the success of the project so far had been due to the fact that I had taken the initiative. Teacher D9g felt that "jy het die wiede aan die rol vir ons gesit met die projek".

The teachers from school E wanted to congratulate me on the way I had monitored the group. Previously when they had mixed with white teachers they had felt inferior to an extent that they did not want to talk, but this had not been the case with this group. Teacher E10b felt that the atmosphere had been such that he "could talk freely to the other people" as the white teachers in the group respected them. They thought that "what you have actually done is you have sort of made us aware that we need each other" and that they could approach the other teachers and also know that the other teachers would approach them.

It was important to me as a researcher that there had to be mutual respect among the members of the group otherwise the project would not have been a successful group project. The fact that the teachers from school A wanted the teachers from school E to help with their Std 6 reserve day confirmed that all group members were seen as equals and were important to the other members of the group.

5.3.15 How do you see my long-term role?

All the teachers wanted the project to continue with me as facilitator.

The teachers from schools A and B considered me "elected" to continue and that "you can't get out of this one" (A2g). The teachers from schools C and D thought that the success of the project would lie with me and that I would have to be prepared to take charge of the project.

Die inisiatief sal by jou moet bly. Ek kan nie dink dat iemand anders nou skielik sal oorvat met so iets. Die sukses van die ding hang af van hoe jy inisiatief gaan behou hierso. (C7b)

Teacher C7b also pointed out that as I had built up a relationship with the other schools' teachers it made it easier for me to facilitate the project.

Teacher E10b saw me as playing a significant role as

you are helping us, you are helping the community of Queenstown, you are helping the municipality, you are helping everybody, even the students

and felt that I would be failing these people if I didn't continue. Teacher E11g mentioned that finding time to take part in the project was a factor but

if we could have time I'm sure we would really enjoy working with you together as a team.

Right from the beginning of the research project I had been aware that when getting involved in action research it tended to be a long-term process. Chisolm (1990:253) looks at the problems of doing action research and remarks that "we researchers cannot simply abstract ourselves from our entanglement". From the comments of the group could be seen that they have definite expectations of me and want this project to continue. As I had wanted to do this project for a number of years I was prepared to continue.

5.4 CONCLUSION

I found that splitting the group into three for the interviews had worked well. The group that had previous experience in cross-curricular work (schools A and B) had a broader view of how they wanted to develop the nature reserve. In focusing on the hunting and the financial aspects of the reserve (refer section 5.3.13), pupils would then be able to make decisions about questions such as: is this area suitable for game farming?, what makes it suitable?, how is the community going to benefit from having the reserve? The group was starting to consider the social, political and economic aspects that form part of the environment.

The other two groups (schools C, D and E) still focused on the biophysical aspect of the nature reserve. These were the groups that had not done cross curricular work before and therefore had less expertise to start with. They had however also developed and gained by having interaction with schools A and B at the workshops. Schools C, D and E stressed that what had been the most important to them had been the interaction with the other teachers of the group.

Schools A and B did not gain that much from the interaction with the other teachers but felt that they had gained the most from the people that were brought in from outside.

There had been some problems working together as a group, but one had to take into account that this was a group where the majority of teachers had never worked collaboratively before. In order to work collaboratively a process of growth was needed that would include problems. Having a cross-cultural group worked well but language remained a barrier. In South Africa there have always been language barriers and as these barriers are deeply entrenched it cannot be expected that they will be broken down within the space of one year. I was struck by the positive attitudes of the research participants and that they all wanted the project to continue.

CHAPTER 6

EVALUATION AND CONCLUSION

This final chapter looks at what has happened in the reserve since the third workshop was held on 22 August 1994. It further aims to consolidate the research findings.

6.1 FURTHER DEVELOPMENTS OF THE PROJECT

Various developments have taken place since the research project started in 1994. Different groups are now using the reserve as a teaching resource.

6.1.1 Progress made**• School A - Std 6 reserve day**

The first group to be taken into the reserve after the third workshop was a Std 6 group from school A for a reserve day in November 1994. School A had previously taken Std 6 groups into the reserve for a cross-curricular day (refer sections 4.1.2 and 4.2.2). A cross-curricular Geography-Biology day was planned by the research participants of school A, which took place in the Longhill reserve. Five modules of 30 minutes each were presented and the group rotated among teacher presenters.

The research participants from school A invited teacher E10b to present a module on Xhosa culture and indigenous knowledge. Teacher E10b did not however want to present a module on his own but would present it if teacher E11g could join him. This module was presented at Waterkloof which was the site the group had visited during the second as well as the third workshop (refer sections 4.3.2 and 5.2). This was the first time the teachers from school E had given an outdoor lesson in the reserve. The presentation went off well and the pupils enjoyed the module. At the debriefing interviews (refer section 5.3.4) the teachers from school E had indicated that they were confident enough to take a group into the reserve

and I was pleased that the module had been successful and that they had enjoyed presenting the module.

The other research participants who presented modules were teacher A1g who did a module on the rock types and a soil profile in the eroded area below the dam wall and A3b who did a vegetation study using quadrants above the dam wall. These were both areas that the group had visited during the second workshop (refer section 4.3.1). Teacher A2g presented a module on mapwork using the 1:10 000 map I had drawn for the second workshop and A4b a module on soil erosion which had been discussed at the second workshop (refer section 4.3.1).

- *School A - Std 8 reserve day*

The next group that went into the reserve for two days was a Std 8 group from school A. School A had not had a Std 8 reserve day before and it was the first time a group spent two days there. This was a cross-curricular Geography-Biology day and was once again organized by the research participants of school A. As I was by that time resident in Queenstown again I was invited to present a module of my own choice and chose to do something on the bushman paintings and the white rhino of the reserve. Bushmen paintings were chosen to highlight the History aspect as had been discussed before (refer section 5.3.13) and I could then make use of the research work that Margo Muller had done on the history of the reserve (refer section 5.3.11). The rhino was chosen as very few of the pupils had ever seen a live rhino before and the importance of animals focused on which the group had also discussed (refer section 5.3.13). The rhino could be used to highlight the biophysical, economic, political, ethical and the aesthetic significance of the environment. The worksheet on the rhino was designed in such a way as to include some of these aspects (see appendix 5). These were ideas that I had tried to include in the course of the workshops (refer section 4.2.1 and 5.3.13) so that teaching in the reserve would not be just **about** and **through** the environment but also bring in the **for**

aspect of the environment. The pupils had lively discussions on these points and talked about how decisions that were taken now and acted upon would affect them in the future. As I was hoping to see the rhino while walking the group the nature conservation officer accompanied me. This again meant that he was directly involved with the use of the reserve by educational groups. As he had missed out on a part of the second and the whole third workshop in the reserve it was important that he was brought in again to see what the group was doing.

One of the presenters was a first year Geography teacher from school A. The other group members had helped her plan her module on settlement geography and although she was apprehensive at first she enjoyed presenting the module. Teacher E10b and two of his Biology colleagues spent a part of the one day in the reserve with the group. I was struck by the confident way he now took part in discussions, in contrast to the first workshop (refer section 4.2.3), and how he informed his colleagues of what we were doing in the reserve. The interaction with the group during the year had meant that he now identified with the group and felt confident that he could make a contribution. One of my assumptions had been that the senior Biology and Geography teachers of the schools would involve the other subject members at their schools and this was now taking place (refer section 3.2). It was gratifying to see that the headmasters of schools C and E had given group members time off from their schools to help and observe in the reserve.

The other modules were all based on possibilities that had been pointed out at the second and third workshop. Teacher A3b did a vegetation study using a belt transect in Tiffin kloof which was one of the places the group had visited at the third workshop (refer section 5.2). The method of transect study had been discussed during the second workshop (refer section 4.3.1). Teacher A4b presented a module on soil and soil

erosion which had been discussed at the second workshop (refer section 4.3.1 and 4.3.3). After the third workshop I had compiled an information sheet about the plants that Cecil Nongwane had talked about in the reserve. This had been done with his help as well as that of teacher A3b who had obtained the scientific names. This information sheet, as well as the information sheet on soil erosion (refer section 4.5.1), were used to compile worksheets. Teacher A2g did a comparative river study at three sites along the Komani river that flows through the town (see figure 1.1), using the waterkit that Barry Irwin had come to demonstrate at the third workshop (refer section 5.2). This was the first time that a module was presented outside the reserve. One of the initial aims of the research project had been to look at the educational potential of the rest of the Queenstown area (refer section 4.2.2).

Although there had been differences of opinion about how pupils would be taken into the reserve (refer section 4.2.2) school A divided the pupils into groups which then rotated. The transport problem (refer sections 4.1.2 and 4.3.4) was solved by obtaining additional minibuses from school B so that each teacher had a minibus in which a group of 15 pupils could be transported. After each module the groups met at Sunnyside (see figure 1.1) and pupils then moved to the minibus of the next presenter. The time slot for each module was 2 hours.

- *Queens College Junior - Reserve day Std 5*

After hearing from pupils who had attended the Std 8 reserve day and reading an article in the local newspaper about this day (see appendix 6), Queen's College Junior teachers approached me to help them organize a reserve day for their Std 5 pupils. This was an exciting development as the group had previously concentrated on high schools. They wanted to do the module on bushman paintings and asked what else I could suggest. After discussing it with some of the other research participants I suggested a game drive with the whole school

group and then three modules. I presented a module on the spoor and dung of four animals in the reserve (white rhino, black wildebeest, zebra and impala) while the nature conservation officer did a module on game management and a teacher from Queen's College Junior the module on bushman paintings. It was the first time that the nature conservation officer presented a module although he had accompanied the previous groups. The teacher from Queen's College Junior who presented the module on bushman paintings had never before done anything similar but was confident that he would manage. I explained to him what I had done with the Std 8 group of school A and after doing some research on bushmen paintings he presented a module combining Art and History. This was interesting to me as I had found that the research participants had not felt that they had enough knowledge before the second and third workshop (refer sections 4.1.2, 4.2.2 and 5.3.2). This once again made me realize that generalizations cannot be made. The other Std 5 teachers were however not confident enough to be presenters and came along as observers.

- *School C - Std 8 reserve day*

This was a cross-curricular Geography - Biology reserve day. Previously the Std 8 group from school C had visited Thomas Baines but the research group members from school C felt that they were now confident enough to take the group into the reserve. It was organized in much the same way as the Std 8 reserve day for school A. Teacher C7b presented a module on the vegetation of Tiffin kloof while teacher A2g once again did the module on water along the Komani river using the waterkit. The new Biology teacher of school A accompanied teacher A2g to see how the module was done. I did a module on soil, soil erosion, siltation of the dams and rock types (refer section 4.3.1). Sections of the worksheets that were used for the reserve day for school A were used although they were extensively modified. It was interesting to see that teacher C7b did a section on ferns that tied in with the

syllabus but added to this plant identification and the uses of plants that was not in the syllabus. Teacher C7b had been the group member that had kept coming back to the fact that outings to the reserve should be syllabus specific (refer sections 4.2.2, 4.4.1 and 5.3.1). This could indicate that although he still regarded the syllabus as a teaching guideline he felt that he could now tie in other aspects as well.

- *Hangklip Omgewingsklub*

During 1995 the Hangklip Omgewingsklub worked mostly in the reserve. After a questionnaire survey of visitors to the reserve the members found that there was a need for more information about the animals and plants of the reserve. They are currently working on a booklet about the animals in the reserve. A booklet had been mentioned at the debriefing interviews (refer section 5.3.2). The members of the club have done all the research for the booklet and are in the process of editing it. The nature conservation officer has been helping in an advisory capacity. The club members have found a fossil of *Kannemeyeria* in the reserve and hope to excavate it during 1996 with the help of paleontologists. At the second workshop the possibility of looking at the fossils of the area had been raised (refer section 4.3.1).

Members of the club helped with preparations for the Std 5 Queen's College Junior day in the reserve. I further observed that co-operative learning was taking place when school C had their Std 8 day in the reserve. Members of the club were identifying trees, animals, dung and spoor for the other pupils. The knowledge of the pupils was an aspect that had not been taken into account during the research. I intend using these members of the club as co-presenters of modules during 1996 reserve days. They would be able to present modules on the animals and fossils of the reserve as they have been working on these aspects.

- *Newspaper column*

Early in 1995 the nature conservation officer and I spoke to the editor of the local newspaper, *The Representative*, and asked whether we could run a monthly column in it. This column would report about groups that visit the reserve, other aspects of the reserve and news of the Hangklip Omgewingsklub. We hoped that the educational potential of the reserve would then become known to more people in the area. The editor was supportive of the idea and reserve days have been given prominence (see appendix 6). This column has received a favourable reaction from the general public who have become more aware of the education that is taking place in the reserve.

- *Municipality*

The municipality has seen that environmental education is taking place and has now built a 'lapa' for educational use. This confirmed the view of teacher B5b who thought that amenities would be provided as soon as school groups started using the reserve (refer section 5.3.13).

6.1.2 Difficulties encountered

Although the nature reserve is now being used as a teaching resource there are still a number of areas that need improvement. The presenters of modules have found that having to repeat modules becomes tedious. The Std 6 and 8 days of school A's modules had to be repeated 5 times. As a teacher is presenting only one module he/she doesn't get the chance to attend the other modules that are being presented. This is however an organizational matter which could be overcome with more than one teacher presenting a module.

Although teacher B5b is taking groups into the reserve for Biology, cross-curricular work is not being done at school B. Even though the teachers from school E have helped present modules and have been to observe modules at cross-curricular days, they have not yet taken their own pupils into the

reserve. The teacher from school D has not been to observe reserve days and has not taken any groups from his school into the reserve. Teacher C8g has also not taken part in reserve days.

I feel that the group identity is being lost as we did not have a workshop during 1995 and I have not been in regular contact with all the group members. Although the research participants indicated at the debriefing interviews that I would have to continue being the facilitator, I find that I do not have time to make contact with all the group members regularly.

Three group members of school A have now left the school. Teacher A3b has retired and left town. Teacher A1g is now programme manager of the primary school support programme at Khululeka Community Education Development Centre in Queenstown and has been elected the northern region representative of EEPI. From 1996 teacher A1g will be presenting an environmental education module for their Independent Study Course in the nature reserve. What has been a loss for school A has been a gain for environmental education in Queenstown and the region. Teacher A2g has left for Elgin where he is to start the Elgin based Community College. He plans to become involved with environmental education for the schools and community. Teachers A1g and A2g will be able to implement what they have gained from being part of the group in their new workplace.

This however means that school A has now lost three of their teachers who have been organizing and doing cross-curricular work. The principal of school A is however keen that the cross-curricular reserve days be continued so the new teachers will be brought into the group. Teacher A1g is willing to assist the new teachers.

The nature conservation officer has also resigned. This is a

education **about** and **through** the environment. For some schools in the group this had been the first time that they had had contact with education **about** and **through** the environment. I had been too optimistic to think that the group would move forward so rapidly that they would have included this aspect. The research participants of school A, especially teacher A2g who presented the module along the Komani river, were however beginning to focus on education **for** the environment.

I still however maintain that the education that is taking place in the reserve should become action orientated where pupils are encouraged to critically reflect on what their actions are going to lead to. I am confident that this will still happen as developing the nature reserve as a teaching resource is an ongoing process.

My initial aim within the goal of the research was for the research project to bring the teachers of the town together. This was a very positive result of the research and was commented on during the debriefing interviews (refer sections 5.3.6 and 5.3.7). This interaction had continued throughout 1995 with group members being part of subject groups in Queenstown as well as helping each other with reserve days. What had been perceived as a language barrier in the group during 1994 (refer sections 5.3.7 and 5.3.10) had not again been experienced. I presented modules in Afrikaans as well as English, while teacher A2g presented the module on water in Afrikaans with school C although he is English speaking. Teacher C7b who is Afrikaans speaking included English notes in his worksheets.

A long-term aim that had been envisaged was that the research participants would later look at the educational potential of the rest of the Queenstown area (refer section 4.2.). Although the group had concentrated on the development of the nature reserve as a teaching resource, they were starting to look wider than the reserve itself. The waterkit was being

pity as he has been involved with the groups in the reserve and has helped to present modules at reserve days.

Doing modules in the Lawrence de Lange reserve has sometimes been problematic as the whereabouts of the white rhinos have to be determined each time. When they are in the vicinity of a site where a module is to be presented an alternative site has to be chosen at short notice. The group had foreseen this as a possible problem at a previous workshop (refer section 5.3.3).

6.2 CONCLUSION

The overall goal of the research had been to initiate a cross-curricular investigation through the perspectives of Geography and Biology into the optimal use of a nature reserve as an ecological resource for the development of education for the environment. This goal was partially fulfilled. Although I had intended that only a Geography and Biology perspective would be used the research participants brought in a History aspect as well. During reserve days in 1995, Art had also been included. As I was engaged in action research I needed to be flexible enough to include other subjects as well. Work in the reserve during 1995 had confirmed the scope for different subjects. Modules that had been presented had not all been syllabus specific. Even teachers who during the research had wanted work to be syllabus specific had now included other aspects.

Although part of the goal had been "education for the environment" this aspect was not realized. In retrospect I do not think it was a realistic goal to achieve within a year. The research members had joined with different views of environmental education but none of them had realized the scope of environmental education. Although I had given the group notes on environmental education this was not sufficient as I did not workshop the concept of environmental education with them. Workshops in the reserve had concentrated on

education **about** and **through** the environment. For some schools in the group this had been the first time that they had had contact with education **about** and **through** the environment. I had been too optimistic to think that the group would move forward so rapidly that they would have included this aspect. The research participants of school A, especially teacher A2g who presented the module along the Komani river, were however beginning to focus on education **for** the environment.

I still however maintain that the education that is taking place in the reserve should become action orientated where pupils are encouraged to critically reflect on what their actions are going to lead to. I am confident that this will still happen as developing the nature reserve as a teaching resource is an ongoing process.

My initial aim within the goal of the research was for the research project to bring the teachers of the town together. This was a very positive result of the research and was commented on during the debriefing interviews (refer sections 5.3.6 and 5.3.7). This interaction had continued throughout 1995 with group members being part of subject groups in Queenstown as well as helping each other with reserve days. What had been perceived as a language barrier in the group during 1994 (refer sections 5.3.7 and 5.3.10) had not again been experienced. I presented modules in Afrikaans as well as English, while teacher A2g presented the module on water in Afrikaans with school C although he is English speaking. Teacher C7b who is Afrikaans speaking included English notes in his worksheets.

A long-term aim that had been envisaged was that the research participants would later look at the educational potential of the rest of the Queenstown area (refer section 4.2.). Although the group had concentrated on the development of the nature reserve as a teaching resource, they were starting to look wider than the reserve itself. The waterkit was being

used to test water along the Komani river in town. This has highlighted the fact that there is a lot of educational potential in the rest of the Queenstown area.

An assumption that I made was that by involving the senior Geography and Biology teachers they would in turn involve the rest of their subject group (refer section 3.2). This had happened to some extent at school A who had a teacher from the Geography subject group presenting a module in the reserve and a teacher from the Biology subject group attending a reserve day module of school A. Two Biology teachers from school E accompanied teacher E10b to school A's reserve day.

An assumption that had not been accurate was that as the research participants had been living in town for at least eight years they would probably continue to be in town for a few more years (refer section 3.2). Three teachers from school A as well as the nature conservation officer have left. This could be problematic for the Geography subject group at school A as there are now no Geography teachers that have any cross-curricular experience. It is hoped that teacher A1g who is still in town will be able to help the new Geography teachers.

Another assumption had been that teaching in the reserve would be considered a worthwhile activity by the teachers (refer section 3.2). The teachers that had been involved in cross-curricular days all agreed that it had been worthwhile. Schools A and C that had been travelling to Thomas Baines each year were now doing cross-curricular work in the reserve as an alternative. The willingness of the principals to let group members help present at reserve days of other schools also indicates that the reserve days are considered worthwhile by them. Principals who at the beginning of the project had agreed that their teachers could take part in the project as long as it did not interfere with their extra-mural activities were now letting the teachers help in the reserve during

school hours as well as in the afternoons. Queen's College Junior that had not been part of the project approached us to present a reserve day. Other schools in the area which include pre-primary, junior and high schools have also expressed an interest in what the group is doing in the reserve and have enquired about the possibility of organizing outings and reserve days for them. The feedback from the monthly newspaper column has also been positive.

Although information and worksheets had been planned by the group only three had been completed. When groups were taken into the reserve during 1995 each teacher that presented a module did a worksheet on that module. These worksheets were available for other groups to use. In retrospect I think that these types of worksheets were a better idea as they were planned with specific groups in mind. When the information booklet that the Hangklip Omgewingsklub are compiling about the animals in the reserve becomes available, it could be used when compiling worksheets.

The way in which groups should be taken into the reserve had been discussed at length during the workshops (refer sections 4.2.2 and 4.3.4). When groups were taken into the reserve during 1995 they were rotated among teachers which seemed to be working well.

An interesting aspect of the research had been the participants view about knowledge (refer sections 4.2.2, 4.3.6 and 5.3.2). In the first workshop knowledge was seen by most participants as being in the syllabuses and textbooks and that experts would have to be brought in to the reserve so that research participants could gain knowledge from them. Schools C and D did not regard indigenous knowledge as relevant to the syllabus. When the group went into the reserve for the second workshop they however found that they knew more than they thought they did. When Cecil Nonqwane and Barry Irwin were brought in they found that people that were considered

'experts' were no different to them. They now saw that they had experts within their own group and community that could be used. The research participants view about knowledge changed as the project progressed. Teachers such as C7b were challenged to rethink their concept about knowledge and a case study could be done on that aspect alone.

During 1994 the group had not realized the potential of the pupils themselves. Although the group had consulted Barry Irwin from St Andrew's who had been a std 10 pupil at that stage our pupils were not seen as being able to present modules. This could be a legacy of our teaching system where we are used to teachers doing the teaching. The excellent project Margo Muller did about the history of the reserves was however used for worksheets (refer sections 5.3.11 and 6.1.1).

The booklet that the Hangklip Omgewingsklub is compiling could also be used in future. I intend letting the Hangklip Omgewingsklub members present modules in the reserve in 1996. Co-operative learning has a lot of potential and a case study could be developed around this aspect.

I, as the researcher, benefitted from learning with and from the group. Being part of the group meant that decisions could be made jointly and problems could be shared. I have gained a lot of confidence from working with the group. At the first workshop I had not been very confident. At this stage I still cannot withdraw as I find myself becoming even more involved in the reserve.

The research presented a process of learning in action, not only for myself, but also for the other participants. Walker (1989:54) found that

Action Research creates opportunities for teachers to work together, to share experiences and problems and to collaborate in their own growth as they attempt alternative ways of teaching.

For me it has been a most worthwhile undertaking and I am looking forward to being involved with the continuation of the project.

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APPENDIX 1

Letter from Queenstown municipality

Municipality



Munisipaliteit

Queenstown

TOWN SECRETARY'S DEPARTMENT
DEPARTEMENT VAN DIE STADSEKRETARIS

Our Ref.
Ons Verw.
Your Ref.
U Verw.

72/10/1b (A J DE KLERK)

Private Bag
Privaatsak X7111 (5320)

Telephone
Telefoon (0451) 3131

Fax (0451) 5547

1994-04-25

Mej Gussie Lückhoff
Departement van Onderwys
Rhodes
Posbus 94
GRAHAMSTAD
6140

Geagte Mejuffrou

U brief gedateer 1994-04-12 verwys.

Graag wens ek u in kennis te stel dat dit vir die Stadsraad 'n voorreg sal wees om u te akkommodeer en kan u die nodige reëlings met die Direkteur van Gesondheid, Parke en Ontspanning, Mnr H Stroebel tref.

Diens


A J DE KLERK
HOOF UITVOERENDE BEAMPTE/STADSKLERK

APPENDIX 2

First workshop: Handouts

Environmental Education

By far the most widely accepted definition of Environmental Education is that of the IUCN (1971):

Environmental Education is the process of recognizing values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the inter-relatedness among man, his culture and his bio-physical surroundings. Environmental Education also entails practice in decision making and self-formulation of a code of behaviour about issues concerning environmental quality.

Another useful and widely quoted description of Environmental Education is that of UNESCO (1985):

Environmental Education aims to foster clear awareness of and concern about economic, social, political and ecological interdependence in urban and rural areas, to provide every person with opportunities to acquire the knowledge, values, attitudes, commitment and skills needed to protect and improve the environment and to create new patterns of behaviour of individuals, groups and society as a whole towards the environment.

One of the South African definitions is:

Planned processes which enable participants to explore the environment, to investigate recognised concerns and to take action to make the world a better place for all living things. (O'Donoghue 1993)

Three approaches to environmental education:

1. Education about the environment is the teaching of environmental facts and concepts.

Education about the environment is the most common form of environmental education. Its objectives emphasize knowledge about natural systems and processes and the ecological, economic and political factors that influence decisions about how people use the environment. Knowledge of the interactions between natural systems and social systems is considered an essential requirement for resolving local, national and global environmental issues and for managing the environment responsibly. However, the integration of natural and social systems is often neglected in programs

of education about the environment. There has been a marked tendency for science and geography, the two secondary school subjects traditionally associated with teaching about the environment, to focus on ecological concepts and technical solutions to environmental problems at the expense of their human causes and of the changes in social systems necessary for solving them (Fien 1993:15).

2. Education **through** the environment is the teaching by experiential learning in nature.

Education **through** the environment uses students' experiences in the environment as a medium for education. The aims of this learner-centred approach to environmental education are to add reality, relevance and practical experience to learning, and to provide students with an appreciation of the environment through direct contact with it. Such experiences may also develop skills for data gathering, skills such as observation, sketching, photography, interviewing and using scientific instruments, as well as social skills such as cooperation and group responsibility. Education **through** the environment may also foster environmental concern if students become captivated by the importance and fragility of ecosystems and the beauty of landscapes, or immersed in the values conflict over an environmental issue (Fien 1993:15).

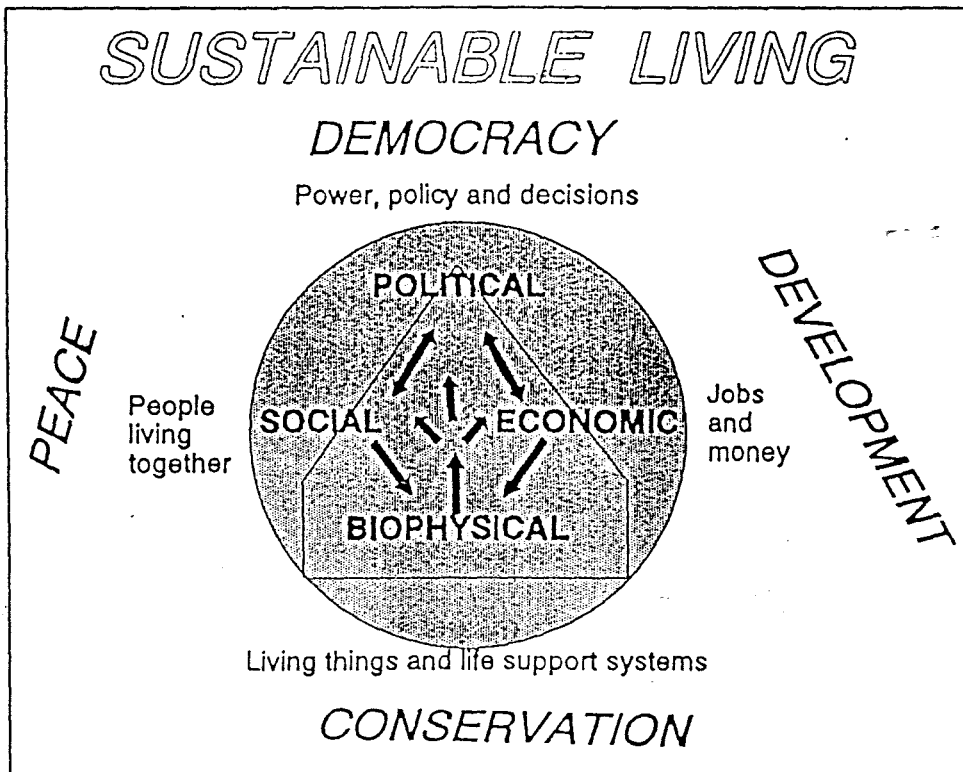
3. Education **for** the environment builds on education **about** and **through** the environment to help develop an informed concern for the environment, a sensitive environmental ethic, and the skills for participating in environmental protection and improvement (Fien 1993:16).

Education **for** the environment seeks to engage students in the active resolution of environmental questions, issues and problems. This involves a wide range of knowledge skill, values and participation objectives which are not addressed by teaching environmental facts and concepts ('education **about** the environment') or by experiential learning in nature ('education **through** the environment') - Fien 1993:5.

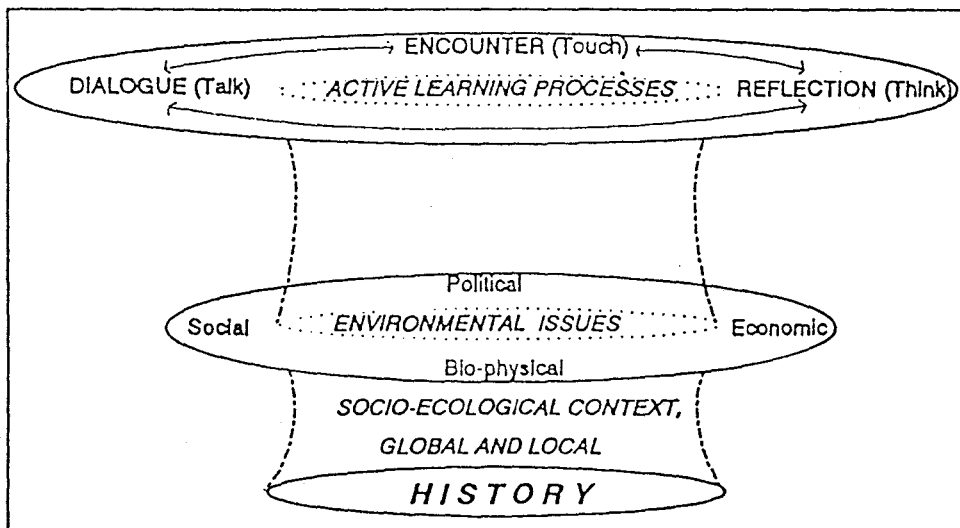
Reference

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THE ENVIRONMENT
 People and other living things
 within life-support systems and processes



ENVIRONMENTAL EDUCATION:
 Meaningful contexts and issues for active learning



O'Donoghue, R. (1993). The environment development and environmental education. A working document for policy and curriculum initiatives in formal education. Environmental Education Initiative. Durban.

'TBILISI PRINCIPLES' OF E.E.

GUIDING PRINCIPLES FOR EFFECTIVE ENVIRONMENTAL EDUCATION AS ADOPTED AT THE 1977 INTERGOVERNMENTAL CONFERENCE ON ENVIRONMENTAL EDUCATION HELD AT TBILISI, USSR.

Environmental education should:

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

APPENDIX 3

Organisational constraints

A summary of the organization that went into planning one of the workshops.

August

- 1 - Group decides that they would like to bring in people from outside the research group. Someone to talk about traditional uses of plants and someone to demonstrate the waterkit.
- 4 - I speak to prof Irwin. He will ask his son Barry if he could come up to Queenstown to demonstrate the waterkit. Monday, 22 August is suggested as a tentative date.
- 5 - Speak to Miss Van Harmelen to invite her to come with us.
- 8 - Telephone Albany Museum to make an appointment with Cecil Nonqwane their education officer. Speak to Cecil Nonqwane at Alaby Museum. He is willing to come up to Queenstown to look at the plants.
Telephone nature conservation officer to hear whether we can use the reserve that day. They still have to do a hunt but he will see that it is not on that day.
- 9 - Telephone teacher 1. School A should not have a problem with the date.
Telephone teacher 7. School C should not have a problem with the date.
- 10 - Telephone teacher 5. School B should not have a problem with the date.
- 11 - Telephone teacher 9. Not sure whether there won't be a problem with the date, but hopes to come.
- 12 - Telephone to confirm 22 August with Cecil at the museum. Send four faxes to the schools to confirm that we are coming up to Queenstown on Monday 22 August. (Fax to school A, School C and D, School E, and to school B and M)
- 16 - Telephone Barry Irwin to talk about the waterkits. Arrange to meet him the following day. Ask Ms Janse van Rensburg to please bring back additional waterkits when she goes up to Pietermaritzburg that week. Speak to Miss Van Harmelen. She cannot come with us to Queenstown.
- 17 - Meet with Barry Irwin. Discuss what the group wants him to do in Queenstown. He will bring the researcher a list of chemicals that he will need.

- 18 - Barry Irwin brings the list of the chemicals he needs. This list is faxed through to teacher 7 at school C. Teacher 7 telephones back later to say that they do not have Laurel Sulphate broth. I telephone Barry Irwin to ask him to get hold of some Laurel Sulphate broth. Telephone teacher 5 to confirm transport. Teacher 5 mentions that the father of nature conservation officer has had a major operation and that he has gone to Bloemfontein. Telephone teacher 1 (who is helping to organize the workshop) who says that we could change the date but it would be better to continue as many of the research participants have already made arrangements and schools have shifted their afternoon schedules to accommodate us.
- 19 - Telephone the Parks department to confirm the use of the reserve even if nature conservation officer is not there. There now appears to be a possibility of a hunt on the Monday. They will however see what they can arrange. I telephone them back later. The reserve will be available for us to work in on the Monday. Telephone teachers 1 and 5 to say that we are definitely coming up to Queenstown that Monday. Telephone Cecil and Barry to confirm time of departure.
- 20 - Telephone teacher 1 who had to contact school E. Confirms that school E is definitely coming.
- 22 - Cecil Nonqwane, Barry Irwin and myself leave for Queenstown.

(Telephone calls = 18, Faxes = 5, meetings/talks = 7)

APPENDIX 4

Allocation of worksheets

- A1g & A2g: Soil profiles.
Weathering and something about sandstone and
dolerite.
Relook at previous worksheets.
- A3b: Grasses.
Possibly something on history of land
utilization.
Possibly something on game farming versus
stockfarming.
Possibly something on dung.
- B5b: Something about Waterkloof.
Possibly something on plant invaders.
- C7b: Water.
Look at the Biology syllabus.
Specific questions to ask herbalist.
- D9g: Mapwork and landforms.
- Nature conservation officer : Fossils.
- Myself: Mapwork.
Soil erosion and techniques to combat it.

Rhino

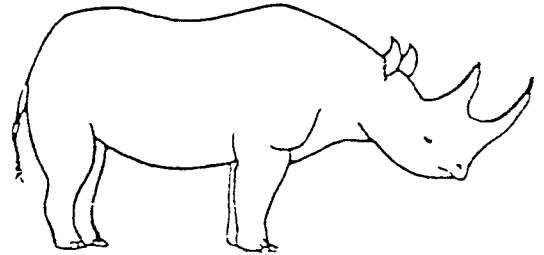
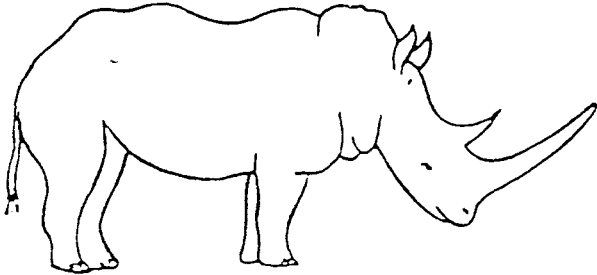
1. Physical characteristics

Closely study the drawings of the white and black rhino.

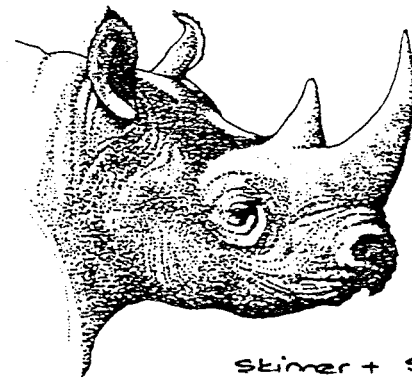
1.1 List at least 5 differences between them.

White rhino

Black rhino



walker (1981)



Steiner + Smithers (1990)

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Other differences are:

Dominant bull territorial
Calf walks in front of mother
Live in small groups
Not very aggressive
Male larger than female
(♂ average 2200 kg
♀ average 1500 kg)
Live ± 45 years
Drinks every 2-4 days

Not greatly territorial
Calf walks behind mother
Solitary
Aggressive
Female larger than male
(♂ average 730 - 970 kg
♀ average 760 - 1000 kg)
Live ± 40 years
Drinks every day if can

2. Habits

2.1 Why do rhino take regular mudbaths?

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2.2 How does the environment benefit from this habit?

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3. Dung

Study some rhino dung.

3.1 What does this dung consist of?

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3.2 What would the dung of black rhino consist of?

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3.2 What becomes of this organic material?

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3.3 Why do rhino use dungheaps/middens?

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4. General

4.1 Rhino horn fetches up to R 25 000 per kg. What is this rhino horn used for?

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4.2 As poachers are only interested in the rhino horn many rhino are now being dehorned in an effort to save the them from extinction. Is this ethical?

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4.3 Do you think we should sell the rhino horns that have been confiscated from poachers and from animals that have died? This money could be used for conservation. If there is a legal trade in rhino horn the prices would probably drop and the incentive for poaching would be removed. It would also be easier to control legal trade than illegal trade.

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4.4 Why bother conserving rhinos? What value do these animals have?

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References

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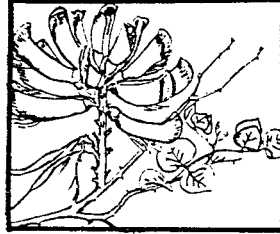
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Articles from The Representative

Nature reserve awareness



The environmental club of Hoërskool Hangklip will be writing a column once a month to make the Queenstown public aware of what is happening in the Lawrence de Lange and Longhill nature reserves.

The emblem of the column is the flower of the Tamboekie Thorn (*Erythrina acanthocarpa*) which is indigenous to the Queenstown area and is found in both reserves.

On Sunday, February 27th, members of the club handed out a questionnaire to every vehicle that entered the Lawrence de Lange reserve between 11:30 and 17:30. Twenty-three vehicles entered the reserve during that period, with a total of 75 members of the public and 130 scholars from J.J. Serfontein.

Most vehicles entered the reserve after 16:00 which can be attributed to the fact that it was a very hot day, with game viewing being better in the late afternoon.

Of the 23 questionnaires that were handed out, the occupants of three vehicles indicated that they visited the reserve at least once a week, 15 indicated that they visited the reserve once or twice a month and five that they only visited the reserve a few times a year.

The occupants were also asked on which day/s they usually visited the reserve and 80 percent indicated on Sundays.

When asked about which aspect of the reserve they would like information, 21 wanted some information on the animals, 10 on the plant life, and 10 on the birds.

The environmental club has decided as a result to compile a leaflet on the animals found in the reserve as well as their characteristics.

Forthcoming events in the reserve: Every Sunday: Guided walks in the reserve that leave at 7:00. Prior booking is essential as only ten people can be accommodated. To book, telephone the municipality at 82233 and ask for the Parks Department.

On March 14 and 15 the Girls High School's standard eight group will spend two days in the reserve for environmental education with the emphasis on biology and geography.

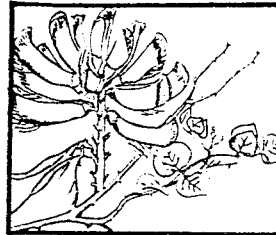


A Girls' High School pupil drawing her own version of a Bushman paintings at Tiffin Kloof in the Lawrence de Lange Reserve during an excursion last week.

The Representative, March 24, 1995

NATURE CORNER

BY
GUSSIE
LÜCKHOFF



GHS girls watch in awe as two rhino move down the hillside only 50 metres away from them at Tiffin Kloof.

Girls see rhinos

Recently 80 GHS Std 8 pupils spent two days in the reserve. They were divided into five groups which rotated between the planned modules set for them.

A town mapping exercise was done from a vantage point on Madeira Mountain. Vegetation in the reserve was studied and a vegetation mapping exercise carried out, and soil conservation was noted. A module on water and water quality along the Komani River was done, as were ones on Bushman paintings and rhinos in the reserve.

The pupils were excited to see all three of the rhino at Tiffin Kloof within 50 metres of the bushman painting site they visited. All marvelled at the way the rhino communicated with each other by sound. The biology teachers of Kwa Komani School joined the groups in preparation of a similar excursion.

The environmental club of Hoërskool Hangklip has also been to see the bushman paintings and are planning to visit the site of a fossil dinosaur.

Prior booking is essential for guided tours of the reserve — telephone 82233 and ask for the Parks Department.

The Representative, April 14, 1995

GAME PARK NATURE LESSON



Queen's College Junior pupils, guided by Miss Gussie Lückhoff, gaining more knowledge on nature during a tour through the Lawrence de Lange Nature Reserve. See story on p12.



Queen's College Junior pupils, who recently visited the Lawrence de Lange Game Reserve, were shown how to do Bushman painting by QCJ teacher, Mr Melvin Beckmann.

QCJ boys visit reserves

NATURE CORNER



BY
GUSSIE
LÜCKHOFF

Recently the Std Five class of Queen's College Junior spent a day in the reserve. The 90 boys first went for a game drive in the Lawrence de Lange Reserve and were lucky enough to see most of the antelope species which occur there, as well as the rhino.

From a vantage point in the reserve the group watched the dominant black wildebeest male successfully defend his territory against the bachelor wildebeest group.

After the game drive the group went to the Longhill Reserve where they worked in rotational class sections. Alan

Wheeler took the boys for a nature walk where they looked at the spoor of different game species, invader plants, trees, and soil erosion, and were shown some snares that have been found in the reserve and how they were supposed to work.

Mr Melvin Beckman did a module on bushman paintings where the boys were given the opportunity to do their own 'bushman paintings' on stones using methods and paints the bushman would have used.

Miss Gussie Lückhoff did the third module on the dung and eating habits of rhino, black wildebeest, zebra and impala. The boys thoroughly enjoyed the day and followed it up with an exhibition of work, done during the reserve day, in their library.

Forthcoming events:
Please note that the guided walks on Sundays leave at 08h00 during the winter months. Prior booking is essential as only 10 people can be accommodated. To book telephone the municipality at 82233 and ask for the Parks Department.



The nature conservation officer of the Lawrence de Lange Game Reserve, Mr Alan Wheeler, conducting a nature walk for Queen's College Junior standard five pupils.



Hoerskool Hangklip's Environment Club members Karen Strydom, Luzaan Erasmus, Lezel Bester, Pierre van der Vyver and Miss Thea Rossouw study the fossil referred to below.

Local fossil found

Recently the environmental club of Hoerskool Hangklip found a fossil in the Lawrence de Lange nature reserve. As it is only partly visible, the club approached the two visiting amateur paleontologists, Martin Etsebeth and Stefa Popich, to visit the site with them.

The fossil is usually found in the shale layer of Karoo Red Beds. In the reserve one can clearly see that this layer of rock was once a shallow, slow moving river course. Mr Etsebeth believes that the fossil could be *Kannemeyeria*, which lived about 215 million years ago, older than most dinosaurs.

Some years ago, the nature conservation officer, Alan Wheeler, found a fossil identified as *Kannemeyeria*.

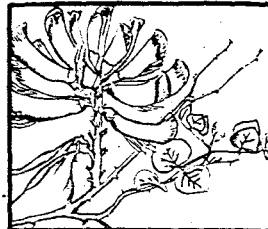
The club plans to excavate the fossil with the help of Mr Etsebeth. He is working in collaboration with the Bernard Price Institute of Paleontological Research at the University of the Witwatersrand, to create an awareness of our pre-historic heritage amongst the youth.

Before the fossil can be excavated, a permit will be needed from the National Monuments Commission, as all fossils found belong to the State.

The excavation will be a lengthy process as

the area first has to be investigated to see whether there are more fossils, and then be fenced. Then the surrounding soil layers must be removed until the fossil is fully visible, at which stage the fossil is sketched and photographed.

Taking the fossil out of the ground involves using a type of superglue to hold it together, and then wrapping it in plaster bandages before transporting it to a

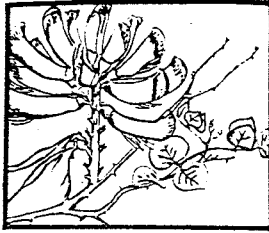


BY
GUSSIE
LÜCKHOFF

museum where it can be studied and cleaned.

The reserve will be closed between 26 June and 23 July.

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Pupils study in Reserve

By Gussie Lückhoff

Hangklip Std 8 biology and geography pupils spent Thursday in the reserve.

They were divided into three rotating groups, with one module near Sunnyside where they looked at soil erosion, how to combat it, penetration of water into soil and siltation of the dams.

Another module was in the region of Tiffin Kloof where they learnt how to identify indigenous plants and studied ferns. The third module was along the Komani River in town where they looked at water quality and pollution, where it was shocking to see how badly this river is being polluted.



The new lapa in the reserve, which will probably be used for educational purposes, as well as for functions.

The day was ended with a braaivleis at Sunnyside.

The Hangklip Ongewingsklub spent Friday night in the reserve, where they took part in the anti-poaching campaign. On the night drive through the reserve they saw kudu, steenbuck and duiker, not often seen during the day.

● Scholars from

Queen's College brought in a fossil, possibly Kannemeyria, which they found in the red shale on Longhill. Although many fossils have been found on the Madeira side of the reserve, few have been found on Longhill.

● There have been a number of new arrivals in the reserve. The eland as well as the red hartebeest have calves and might be seen on Circle Drive. The

springbok are lambing in both the Lawrence de Lange and Longhill reserves, while impala, blesbuck and fallow deer lamb from December to January.

There are also newly hatched ostrich chicks.

● The reserve opening times in summer are: 07h00 — 19h00 (Saturdays and Sundays) and 08h00 — 17h00 (Mondays to Fridays).

The Representative, November 17, 1995

NEW LAPA

At a general action committee meeting on Tuesday councillors agreed that the lapa in the Lawrence de Lange nature reserve be used only for environment educational purposes under the supervision of the nature reserve officer until such time that facilities like toilets had been added.

The Representative, November 24, 1995