A RESOURCE-BASED LEARNING APPROACH TO PROFESSIONAL DEVELOPMENT – THE CASE OF THE ACEE (RHODES UNIVERSITY ADVANCED CERTIFICATE IN ENVIRONMENTAL EDUCATION).

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ABSTRACT

This interpretative case study derives and examines the characterising features of the resource-based learning approach used in the Rhodes University Advanced Certificate in Environmental Education (ACEE), particularly in Module 1 (Environment and Environmental Issues) and Module 3 (Contemporary Environmental Issues). The study explores processes of resource-based learning through the analysis of three individual case stories of participants' experience in adaptive use of learning support materials in different work contexts. It discusses the relationship between thematic categories related to participants' experience of assignment work, and course design and course implementation.

This study indicates that resource-based learning processes in the ACEE involve curriculum deliberation and the use of resource packs in supporting participants' practice. It also indicates that the ACEE's practice-based orientation to workplace-based assignments plays an important role in supporting the adaptive use of learning support materials, encouraging lifelong learning and developing applied competence. It highlights the significance of reflexive narration of practice in improving course participants' educational practice. A diagrammatic representation of the unfolding and intermeshed characterising features of resource-based learning is presented.

The study argues that resource-based learning in the ACEE appears to create possibilities for the course participants to become scaffolders and co-constructors of their own learning. It notes that resource-based learning can enable course participants to take ownership of their educational and workplace needs, and to develop skills and competences necessary to respond to environmental issues and risks in southern Africa. This study examines the potential that the reflexive narration of practice has in supporting course participants to engage in better ways of doing things in their workplace-based contexts.

This study provides some recommendations to enhance the Advanced Certificate in Environmental Education as well as some 'fuzzy generalisations' that might guide the Southern African Development Community (SADC) Regional Environmental Education Programme (REEP) in the development and adaptation of professional development courses in southern Africa.

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LIST OF ABBREVIATIONS

AM	Analytic Memo
AS	Analytical Statement
ASS	Assignments
CS	Case Stories
CT	Comparative Table
FGD	Focus Group interviews with course Developers
FGP	Focus Group interviews with course Participants
FGT	Focus Group interviews with course Tutors
INT	In-depth interview with course participants
MOD	Module

CHAPTER 1 – INTRODUCTION TO THE RESEARCH

1.1. Introduction

In this chapter I look at training courses and materials development initiatives in the Southern African Development Community[1] (SADC) Regional Environmental Education Programme (REEP) to develop the rationale for this research. I then introduce the Rhodes University Advanced Certificate in Environmental Education (ACEE) as a case study to generate data on the characterising features of a resource-based learning approach to professional development. This allows me to develop the aim and goals of the research and to provide a brief orientation to the chapters of the study that follow.

1.2. The SADC Regional Environmental Education Programme

The Southern African Development Community (SADC) Regional Environmental Education Programme (REEP) was established in 1997. The SADC REEP is located within the SADC Food, Agriculture and Natural Resources (FANR) directorate and it is based in KwaZulu-Natal, South Africa under the auspices of the Wildlife and Environment Society of South Africa (WESSA). Since 1998 the SADC REEP has been responding to environmental issues by implementing and supporting professional development courses as well as encouraging the adaptation and development of a wide range of environmental education materials (SADC REEP 2002) (see Section 2.2).

The SADC Regional Environmental Education Programme recognises environmental education (EE) as a response to environmental issues and risks in southern Africa and it aims "… to enable environmental education practitioners in the SADC region to strengthen environmental education processes for equitable and sustainable environmental management choices" (SADC REEP 2002:14). According to the SADC REEP (*ibid.*) this is to be achieved "… through enhanced and strengthened environmental education policy, networking, resource materials and training capacity". In this research I focus on the latter two aspects, namely resource materials and training capacity.

Alongside its activities the SADC REEP has worked with partners to develop materials to support training initiatives in southern Africa (SADC REEP 2002). These materials include sourcebooks on *Curriculum Development Frameworks* (see Lotz 1999) and more recently on the *Development, Adaptation and Use of*

[1] The Southern African Development Community is made up of 14 southern African member states: Angola, Botswana, Democratic Republic of Congo, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Seychelles, Swaziland, South Africa, Tanzania, Zambia and Zimbabwe (SADC REEP 2002).

Learning Support Materials (see Russo & Lotz-Sisitka 2003). Widening activities have led to the establishment of a southern African Course Development Network (CDN) which is aimed at addressing the growing regional demands for the development and support of environmental education courses (Russo & Lupele 2003).

The research focus for this study arose within my role as an employee of the SADC Regional Environmental Education Centre, working on the development of learning support materials at both national and regional level, and supporting the implementation of a number of professional development courses. I hope that through this research I will be able to clarify resource-based learning approaches in professional development with a view to informing the development and implementation of more relevant and effective training courses and learning support materials (and their adaptive use in courses) at the SADC Regional Environmental Education Programme. For this, the Advanced Certificate in Environmental Education will be used as a case study to identify characterising features of resource-based learning.

Apart from implementing and supporting professional development courses, developing learning support materials and addressing environmental issues through various activities, the Programme is also trying to develop more meaningful and effective approaches to teaching and learning (SADC REEP 2002). In doing this, the Programme has established partnerships with diverse educational institutions, notably Rhodes University in South Africa, in terms of course development, course implementation and materials development. This partnership is evident in courses such as the SADC/Rhodes University International Environmental Education Certificate Course, the Gold Fields Participatory Environmental Education Course, the Swaziland Participatory Environmental Education Course and more recently the Rhodes University Advanced Certificate in Environmental Education.

1.3. The Advanced Certificate in Environmental Education

The Advanced Certificate in Environmental Education (ACEE) is a two-year course offered by the Rhodes University Faculty of Education, through the Rhodes University Environmental Education Unit. The first course was offered in 2002 with the aim to give "… environmental educators a better understanding of how to improve their teaching within the dynamic context of environmental and educational policy change" (Timmermans 2003:10). This semi-distance course emphasises the development of participants' applied competence through a process of resource-based learning that involves the adaptive use of learning support materials in their workplace contexts (see Section 2.7).

The Advanced Certificate in Environmental Education identifies two approaches to learning, namely resource-based learning for Year One and research-based implementation for Year Two. In Year One, course

participants are engaged in exploring how a range of learning support materials can be used in different contexts to support environmental learning activities (RUEEU 2002a). In Year Two, the focus is on the implementation of a small scale action-research project (*ibid.*). The course covers topics such as ecology and the environment; environmental education processes; curriculum development; and theory of education (Timmermans 2003). For the purpose of this research Year One is examined notably the implementation of two modules where learning support materials are adaptively used in workplace-based assignments (RUEEU 2002a). These two modules focus on the *Environment and Environmental Issues* (Module 1) and *Contemporary Environmental Issues* (Module 3).

The Advanced Certificate in Environmental Education reflects resource-based learning as a contemporary response to problems with course and materials development. In doing so it places a strong emphasis on environmental learning in context (see Section 2.7). In the course, attention is given to learning in context through a process where course participants have to adapt and use materials in their work context with learner groups (RUEEU 2002a). They also have to report their activities with a view to improving or changing their practice (*ibid.*).

The Advanced Certificate in Environmental Education was selected for this research because it seems to provide an opportunity to examine the characterising features of a resource-based learning approach in a professional development course. This study had been designed to probe how a resource-based learning approach is developed and implemented in the course. It investigates the relationship between course design and implementation, and the adaptive use of learning support materials with learner groups by course participants in diverse contexts with a view to informing environmental learning activities.

1.4. Research aim and goals

The aim of this research is to identify the characterising features of the resource-based learning approach used in the 2002/2003 Rhodes University Advanced Certificate in Environmental Education. An interpretive case study approach is used (see Section 3.2.2) to explore the following goals which guided this research:

- To investigate how the course design and implementation enable resource-based learning processes;
- To probe how tutors support the use of learning support materials in the Advanced Certificate in Environmental Education; and
- To explore how participants engage in adaptive use of learning support materials in their work context.

In addition, the findings of this research will also be used to inform the development and implementation of resource-based learning approaches in the context of the courses developed and implemented by the SADC Regional Environmental Education Programme.

1.5. Overview of the chapters

Chapter two introduces historical and contextual perspectives that form the backdrop to this research. In this chapter I provide an orientation to how environmental education processes have emerged as responses to environmental issues and risks as well as how professional development courses in southern Africa are being developed to support such processes. My experience in the SADC Programme is drawn on to provide background on the development and use of learning support materials in courses where there is an emphasis on resource-based learning. A brief history of course development and implementation, and the use of learning support materials in fostering and enhancing environmental learning in southern Africa is provided to locate problems of course development and implementation within the context of this research. This chapter also clarifies how a focus on context in professional development has led to the emergence of resource-based learning approaches in professional development courses.

In chapter three I describe and justify the research design decisions that I make to generate data to address the aim and goals of the research. This is done by explaining the choice of an interpretive orientation to research as well as the reasons for approaching the research as a case study. As the choice of methodology influences the choice of research techniques and has ethical implications I further explain how the techniques were employed for data generation in relation to the context of the research. I also take into consideration ethical issues, organisation of data, validity and trustworthiness of the research findings. The process of data analysis and interpretation is presented in this chapter and the thematic categories that have emerged from the data in relation to participants' experience of assignment work, and course design and implementation are introduced.

In chapter four, following an initial data analysis, I present the research findings firstly by providing a summary of the focus group interviews with course participants. This allowed me to develop an initial diagrammatic representation of a possible framework for resource-based learning in the Advanced Certificate in Environmental Education. Three individual case stories of course participants engaged in the adaptive use of learning support materials in different contexts are then presented. I draw on the case stories to provide an analysis of participants' experiences of assignment work. Subsequently, using a comparative table developed to clarify the course structure, I share an analysis of findings in relation to the thematic categories for course design and ways of supporting course implementation introduced in chapter three. The interviews, case stories

and analysis of the course processes provide a detailed picture of the course processes for a more detailed analysis in chapter five.

Chapter five reviews and discusses the research findings within thematic categories established in chapter three. This is done by considering the relationship between participants' experience of assignment work, and course design and implementation. By drawing on specific examples of the Advanced Certificate in Environmental Education course materials and the data presented and analysed in chapter four I present and discuss the characterising features of resource-based learning in the course. This discussion is located within current debates surrounding professional development and resource-based learning.

Chapter six provides a brief summary of the research process. It draws conclusions and makes recommendations specific to the Advanced Certificate in Environmental Education, and highlights areas that might be enhanced. These recommendations are also made with the intention of providing insights into the development and implementation of training courses and materials in the SADC Regional Environmental Education Programme in the form of 'fuzzy generalisations' (see Bassey 1999). In this chapter I also review the research process, both in terms of methodology and in relation to the data generation processes employed.

1.6. Conclusion

Recognising that the role of the SADC Regional Environmental Education Programme is to support environmental education processes in southern Africa and that there is a need for more relevant and effective training courses and learning support materials, the Rhodes University Advanced Certificate in Environmental Education is an ideal context within which to review the relationship between course design and course implementation, and the adaptive use of learning support materials. Resource-based learning in the Rhodes University Advanced Certificate in Environmental Education is thus examined to identify the characterising features of these processes in a professional development setting.

These issues cannot be explored without a review of environmental education in professional development, a probing of issues associated with courses and materials, and the clarification of resource-based learning. The next chapter offers a discussion on these issues. It provides the context and history within which the research of the Advanced Certificate in Environmental Education was undertaken and clarifies the problems that have emerged from the development and replication of courses in southern Africa. It also looks at how resources are increasingly seen as learning support materials within professional development settings.

CHAPTER 2 – CONTEXT AND HISTORY

2.1. Introduction

This chapter outlines the context and history within which this study of the Advanced Certificate in Environmental Education (ACEE) was undertaken. This is done by clarifying problems that have emerged in the development and replication of courses in my job situation within the Southern African Development Community (SADC) Regional Environmental Education Programme (REEP). Particular attention is given to the professional development and course design, and the development, adaptation and use of resources as learning support materials in course processes. Available literature is reviewed and a brief history of course and materials development in the SADC region is provided to locate the challenges of course development and implementation for this research.

This chapter examines how the Programme has been responding to environmental issues and risks in the SADC region. It also reviews contextual influences and developing perspectives on professional development. The developments that seem to have been shaping course development in southern Africa include:

- Environmental education and environmental crisis (2.2);
- Professional development in environmental education (2.3);
- Course development in southern Africa (2.4);
- Materials development in southern Africa and their use in courses (2.5); and
- Resource-based learning in professional development (2.6).

This research focuses on professional development processes within the context of adult learning and is guided by principles of contextuality, participation and critical reflection (Robottom 1987a; Lotz & Robottom 1998; Lotz 1999). This is done owing to the influences of these principles in the development of environmental education courses in southern Africa (Lotz 1999; SADC REEP 2002).

The main focus of the research is on an emergent approach to professional development courses (resource-based learning) used in Year One of the ACEE (see Sections 1.3 and 2.7). Research on professional development has been conducted in many countries in southern Africa. This has been focusing on:

- Skills development and the role of professional development courses in supporting environmental education processes (Janse van Rensburg & Le Roux 1998);

- Investigating issues in adapting professional development courses to different contexts (Heylings 1999);
- The use of materials in flexible environmental education courses (Molose 2000);
- Accreditation issues in open process courses (Raven 2000);
- The influence of professional development courses on the development or adaptation of new environmental education courses (Chadwick 2002); and
- The development of reflexive and applied competence in course processes (Raven 2003).

The reason for exploring resource-based learning in professional development settings is that this important contextual and action-centred response to environmental issues and risks has not been explicitly researched in semi-distance courses in environmental education.

2.2. Environmental education and environmental crisis

Recognising that environmental education courses in the SADC region have emerged as a response to environmental issues and risks (SADC REEP 2002) it seems important to gain a better sense of these issues and risks. It also seems essential to clarify how educational responses have been drawing on materials to support course implementation in southern Africa. These responses will help to describe the history of course development and materials development in southern Africa, which informed the genesis of the Advanced Certificate in Environmental Education.

2.2.1. Environmental issues and risks in southern Africa

Current knowledge of environmental issues and risks indicates that problems arising from human-environment interactions are becoming more complex, involving political, social, economic and biophysical dimensions (Lotz 1999; EEASA 2002; SADC REEP 2002; UNEP 2002). Technological advancements, an increase in mass production and associated patterns of consumption have added to this complexity, despite the development of new technologies as attempts to resolve environmental problems. According to UNEP (2002:38) many of the new technologies and scientific advances have also brought "… unforeseen risks to human health and the environment". Examples of these risks are the recent debates on the impacts of genetic modified organisms, industrial accidents resulting from technology failures, the unforeseen side effects of some drugs and green house gases (UNEP 2002). In a review of the unforeseen and unpredictable processes such as these, Beck (1992, 1999) suggests that the limitations of knowledge systems and the uncertainties associated with potential impacts of scientific and technological developments have created a 'risk society' within which our ability to address environmental issues has a poor track record.

In southern Africa, added to these risks are the challenges of poverty alleviation, loss of biodiversity, land degradation, water stress and scarcity, globalisation, armed conflict and widespread diseases (EEASA 2002; SADC REEP 2002; UNEP 2002). These problems are, in part, owing to patterns of economic development where the natural resources of this region were exploited for the economic benefit of the nations in the North (UNEP 2002). This situation of global inequity is exacerbated by rapid population increase and poor governance in the South (SARDC, IUCN & SADC 1994; UNEP 2002). To address this situation, a number of global responses to the environmental crisis have been suggested and these include improving environmental management, alleviating poverty, reducing the excessive consumption of the more affluent, improving governance, providing adequate funding and eliminating debt (UNEP 2002).

A consequence of scientific and industrial development is that developing issues and risks are often not limited in time (affecting future generations) or in space (crossing national borders) (Beck 1992). An engagement with these environmental issues and risks is evident in responses such as community-based natural resource management, the development of multilateral environmental agreements, an emphasis on eco-tourism and sustainable agriculture and moves towards eco-efficiency, among others (SADC REEP 2002).

It is difficult to identify a single issue or risk that is most important and might be resolved in isolation. Lotz-Sisitka (in press a:1) suggests that the complexities are manifest "… at a local level, affecting the livelihoods and sustainable living options of local people." It is a recognition of realities such as this that educational activities such as **capacity development and environmental education** have developed as responses to the environmental crisis.

Recognising this developing scenario and the need for the educational processes that are responsive to environmental challenges, the SADC Regional Environmental Education Programme was established (SADC 1996). This Programme has increasingly focused on professional development and on the development of learning support materials to support capacity development activities, course development, networking and policy processes in southern Africa (SADC REEP 2002). Educational responses such as this require ongoing clarification of learning processes within complex and changeable contexts and the development of contextually relevant materials to support such processes.

2.2.2. Environmental education as a response to the environmental crisis

Environmental education and capacity development have been recognised as key responses to environmental issues and risks (UNCED 1992; ICAE 1993; Lotz 1999; SADC REEP 2002; UNEP 2002). The SADC REEP recognises that these responses cannot be seen as separate entities but rather as "… facets of a complex

holistic response to broad environmental risks" and note that environmental education processes play an important role in responding to environmental issues and risks (SADC REEP 2002:10).

The capacity of human society to address environmental issues and risks differs according to context, skills and patterns of environmental change. It is thus important that humans have appropriate technology, education and training, skills, infrastructure, access to resources and information for enhanced environmental management capabilities (UNEP 2002). Recognising that these changes are even more complex in a 'risk society', Beck's (1992, 1999) work seems significant in terms of providing new futures perspectives, encouraging people to think ahead and reflexively and critically analyse the consequences of technological and industrial initiatives. Beck (1992) argues for environmental learning[2] processes which are open-ended and reflexive. O'Donoghue (2001:5) also argues for open-ended processes of environmental learning which encourage "critical reflexive re-orientation" aimed at "sustaining human interactions in healthy, just and equitable environments".

The SADC Regional Environmental Education Programme (SADC REEP 2002:10) notes that current responses to environmental issues and risks in southern Africa "… are taking place within a broader international setting and are therefore influencing and being influenced by these international processes". However, Lotz and Robottom (1998:24) call our attention to the fact that "… local environmental issues are often particular and different from abstracted and generalised global dimensions". Therefore, responses to environmental issues need to recognise the complexity and contextuality of environmental issues and risks (Robottom 1987a). These aspects seem to have been recognised in the way collaborative and participatory environmental education courses have been developed in many southern African countries (Parker & Murray 1999; SADC REEP 2001).

The Programme (SADC REEP 2002) notes that educational responses need to recognise the importance of context, and local and scientific knowledge. This is supported by Beck (1992) who argues that a combination of scientific conclusions made in the laboratory and perspectives prevailing in real-life social situations should be reconciled as part of learning processes. It has been recognised that environmental education processes of engaged meaning-making such as this have a key role to play "… by supporting open processes of teaching and learning that inform and enable appropriate environmental management choices" (SADC REEP 2002:10). Recognising that responses to complex environmental issues and risks require "… a radical re-orientation of education and training in all sectors" (EEASA 2002:4), environmental education processes are:

[2] EEASA (2002:6) considers that "… environmental learning involves cognitive competence, critical thinking, values, and social and individual confidence and competence, as well as a mobilising of prior knowledge and experience".

- responsive processes of social transformation that involve the development of capabilities and skills (Janse van Rensburg 1995);
- open-ended, reflexive, critical and responsive to environmental issues and risks broadening our understanding of 'environment' (Lotz 1999);
- cognisant of different systems of knowing and social values about environmental issues and risks (mobilising learners' prior knowledge) fostering critical engagement with local and contextual issues and encouraging action-taking. These processes should encourage reporting and enhance self-reflection and critical reflexive re-orientation (O'Donoghue 2001);
- responsive to changing context and needs recognising prior knowledge and promoting flexible processes that allow for meaningful learning and skills development (SADC REEP 2002); and
- socially transformative, supporting environmental learning that involves a deeper understanding of environmental issues and a commitment to action (EEASA 2002).

These perspectives have led to revised approaches to education and training (Janse van Rensburg & Le Roux 1998; Lotz 1999; Lotz-Sisitka & Raven 2001; Lotz-Sisitka in press a) where professional development has come to include the notion of resource-based learning and use of learning support materials (Brown & Smith 1996; Czerniewicz *et al* 2000; Lotz-Sisitka & Raven 2001). These perspectives have developed as educators have developed and implemented professional development courses in southern Africa.

2.3. Professional development in environmental education

Current perspectives on professional development initially arose as a response to 'technicist' and 'information technology' approaches to environmental education and adult learning (Robottom 1987a, 1987b) and as way of responding to complex environmental issues through teacher education and development (Taylor 1980; Leach 1996). Both Robottom (1987a) and Leach (1996) acknowledge that the shifts in approaches to professional development are also influenced by the new technological communication and information advancements. Perspectives on professional development in environmental education initiatives have been developed throughout the years which seem to be time-, context- and purpose-specific all of which promote lifelong learning[3] that has come to be specified to include the development of certain skills and competences (Robottom 1987a, 1987b; Fien & Rawling 1996; Janse van Rensburg & Le Roux 1998; Lotz 1999).

Fien *et al* (1993:v) argue that the rationale for professional development in environmental education requires a "… wider response than the training of skilled environmental managers or the training of teachers in ecology

[3] The notion of lifelong learning is described by SAIDE (1997:48) as "… the continuation of self-initiated, open-ended intellectual inquiry and knowledge acquisition". SAIDE (1997) notes that lifelong learning should be a continuous process throughout learners' life and should be relevant to learners' needs and life experiences.

and interpretation of nature". They (*ibid.*) consider that environmental education processes have evolved as a field of professional practice seeking to develop practical skills, understandings and values needed to address environmental issues, as well as processes seeking to provide lifelong experiences. This is supported by the international trends towards lifelong learning (Taylor 1980) that note that educational systems and institutions should develop a range of information literacy and learning skills in learners (SAIDE 1997) as well as restructure education so learners can take responsibility for the learning process (Bleakley & Carrigan 1994).

According to Lotz (1999) the importance of professional development in adult education has been influenced by the notion of lifelong learning and the shifts from adult education to adult learning. This is evident in the need to recognise the direct relationship between theory and practice (Leach 1996) and as the challenges of "… environmental education processes extend beyond the traditional boundaries of institutionalised education" (Lotz 1999:58).

Robottom (1987a, 1987b) argues that there is a double challenge in the rationale for professional development in environmental education. One challenge (information technology) is related to a dominant form of professional development based on the RDDA approach (Research-Development-Diffusion-Adoption) and the other challenge (information critique) represents a different approach to professional development and recognises that learners draw on prior knowledge and experience to guide practice and construct new knowledge (Robottom 1987a). For Robottom (*ibid.*:298) these guiding principles are important for the challenges that environmental educators face due to the "… need to be actively involved in working together towards the solution of *environmental* problems [and] … *educational* [emphasis on original] problems associated with their profession".

The guiding principles from Robottom (1987a) seem to be relevant to this research due to their influence in the development of courses in southern Africa (Janse van Rensburg & Le Roux 1998; Lotz 1999; Janse van Rensburg & Lotz-Sisitka 2000). According to Robottom (1987a), environmental education should strive to be:

- Enquiry-based;
- Participatory and practice-based;
- Critical;
- Community-based; and
- Collaborative.

Leach (1996:101) notes that professional development is a continuum and complex 'career-long process' that is about real change and must be directed at making connections between theory and practice. In an

evaluation of professional development in an environmental education course, Janse van Rensburg and Le Roux (1998:83) agree with Leach and further note that "… enhanced understandings of the contextual complexities of a work situation and developing a broader understanding of environment appear to be key processes contributing to professional development". Also based on an evaluation of a Masters course in environmental education, Fien and Rawling (1996:11) recognise professional development in environmental education as processes playing an important role in creating a "… broad social context necessary for ecologically sustainable development". They conclude that reflective practice experiences, based on critical reflection and praxis, are "… central to a critical approach to midcareer professional development in environmental education (*ibid.*:19).

In a response to challenges above and as a way of enabling environmental education practitioners to address complex environmental issues and risks the SADC REEP developed a sourcebook on *Developing Curriculum Frameworks* (see Lotz 1999). This sourcebook, which draws on Robottom's (1987a) principles, recognises that there are many ways of engaging with professional development (Lotz 1999) that appear to depend on people's background and context (Janse van Rensburg & Le Roux 1998). Based on professional development initiatives in southern Africa five key features for curriculum deliberation in professional development courses have emerged from courses in the SADC region (Lotz 1999). These key features include:

- Responsiveness;
- Flexible course structure;
- Participation;
- Praxis; and
- Assessment as learning (Lotz 1999).

These features have been widely used in a number of environmental education course development initiatives in southern Africa (Lotz-Sisitka in press b). Many environmental education courses in the SADC region have been shaped by these principles, notably the Gold Fields Participatory Environmental Education Course and the SADC/Rhodes University International Environmental Education Certificate Course (Lotz 1999; SADC REEP 2002). For example, in developing courses for industry in South Africa and Zimbabwe, course developers considered how the curriculum was responding to different social-ecological contexts through workplace-based assignments (Lotz 1999). According to Lotz-Sisitka and O'Donoghue (2002:8) "… the challenge of enabling work-based professional development requires the skills of responsive course development in different contexts". In some courses, participation is viewed as a more deliberative, interactive process rather than assuming that processes such as this happen as a matter of course as people participate in the programme (Janse van Rensburg & Le Roux 1998).

The developing narratives suggest that contextually relevant learning support materials (LSM) have an important role to play in professional development and in the design of activities on these courses (see Section 2.5). Lotz-Sisitka and Raven (2001:50) emphasise this issue by stating that "… the central role of LSM in professional development processes, highlights the need for, and importance of, LSM in supporting the professional development of teachers". Czerniewicz *et al* (2000:75) support this argument by noting that learning support materials are central "… in providing scaffolding for learning and teacher support". The important role that learning support materials play in fostering environmental learning in the SADC region is also acknowledged by the SADC REEP (2002) and this involves a focus on the adaptation, development, use and dissemination of learning support materials. From the above, it seems that a focus on skills development and on the appropriate use of contextual learning support materials in courses (to foster environmental learning) provides a starting point for the discussions on resource-based learning (see Section 2.6).

Czerniewicz *et al* (2000:30) suggest that "… little research has been done into LSMs other than textbooks", and recommends that research should be undertaken in this area. Their findings also indicate that there is a need for a better understanding of learning support materials from a social constructivist orientation to learning (*ibid.*). Recognising the relationship between learning support materials and professional development this relationship appears to be an important area of work and ongoing research (Vinjevold 1999; SADC REEP 2002). This relationship will be considered during this research.

2.4. Course development in southern Africa

Over the past decade a number of participatory professional development courses that recognised environmental education as a response to the environmental crisis have emerged in southern Africa. Several environmental education professional development initiatives can be traced back to the *Gold Fields Participatory Environmental Education Course* established in South Africa in 1992 (Janse van Rensburg & Le Roux; Lotz-Sisitka & O'Donoghue 2002). This part-time semi-distance course was initially developed "... for education officers working in environmental education centres to help them to develop an understanding of the *educational thinking* [emphasis on original] behind environmental education processes" (RUEEU 2002b:2). This course has been replicated and adapted in many SADC countries, including participants ranging from teachers and curriculum developers, to community workers and materials developers (Janse van Rensburg & Le Roux 1998; Molose 2000; Lotz-Sisitka & O'Donoghue 2002; RUEEU 2002b).

In many cases, the course adaptation and replication processes have contributed to the development of more contextually relevant course materials (Lotz-Sisitka & O'Donoghue 2002). According to Lotz (1999) these

courses are designed around a flexible course structure that allow for participation and responsiveness to the needs and contexts (e.g. Namibia, Swaziland and Zanzibar). Due to the responsive nature of environmental education processes, in some cases, like Malawi, South Africa and Zimbabwe, the focus of the course has been changed to address issues such as industry, conservation and environmental management (Lotz-Sisitka & O'Donoghue 2002; Lotz-Sisitka in press b:9). According to the SADC REEP (2002) the format of the Gold Fields course (year-long, semi-distance and part-time) has also been changed to more full-time residential and short-term courses such as one-month courses (e.g. Angola and Zambia) and the SADC/Rhodes University two-month course in South Africa. The emergence of courses such as these has sometimes been stimulated by individual interests and motivation (Chadwick 2002) and by a growing network of environmental educators interested in course development (Lotz Sisitka & O'Donoghue 2002).

A growing demand for course development in the SADC region has led to a Course Development Network being established in 2002 (Russo & Lupele 2003). The Course Development Network has recently produced a toolkit to support course development processes and address issues associated with course development (Lotz-Sisitka & O'Donoghue 2002; SADC REEP 2003).

2.4.1. Issues associated with course development

As illustrated above, a number of environmental education courses in southern Africa have drawn on the *Gold Fields Participatory Environmental Education Course*. In the process of adaptation, development and implementation of courses in southern Africa, course developers have been faced diverse course design issues. These relate to the way some courses are increasingly failing to develop responsive curricula and informed praxis (Lupele 2003b). Lotz (1999:2) notes that both principles of responsiveness and praxis should be part of curriculum deliberation which is "… an ongoing, reflexive process of adaptation and change in the context of the course and in the supportive company of others". Raven (2003:231) notes that decontextualised approaches to course curriculum have also failed to provide appropriate links between the course assignments and the work context of the course participants paying little attention to the relationship between "… theoretical ideas and their [course participants'] proposed practice". She further notes that in some cases more emphasis is given on assignments as 'products' rather than to learning processes (Raven 2003).

Lotz-Sisitka (in press b:11) notes that one of the successful dimensions of an industry course in Malawi was the focus on workplace-based assignments where "… participants were able to bring and discuss problems they encountered in their workplaces to the course". The focus that assignments place on participants' workplaces encourages "… the development of various aspects of professional development that support a reflexive review in/of practice" (Raven 2003:144). Lotz-Sisitka (in press b:11) further notes that most education

programmes are "… often either just technical/practical, or theoretical, and disembedded from the context where action and changes are required".

Rhodes University has been working with the Course Development Network through a consortium of universities and higher education institutions in southern Africa to provide sustained support to course development in the SADC region (Lotz-Sisitka & O'Donoghue 2002). In doing that, the Course Development Network has identified five key challenges for course development, namely:

- Processes of curriculum deliberations;
- Course materials writing;
- Learner and tutor support;
- Assessment and accreditation of learning; and
- Evaluation and evaluation reporting (Russo & Lupele 2003).

For this study of the ACEE, my attention is focused on course development (including curriculum deliberation processes) and the use of course materials for resource-based learning in workplace-based contexts.

Environmental education courses in southern Africa have also been influenced by demands from educational institutions, perceived needs of particular individuals, and by availability of funds (Lupele 2003b). The individualisation of courses has led to problems related to long-term (financial) sustainability and failure of institutionalising courses "…within the national priorities of individual SADC member states" (Lupele 2003b:3) as well as problems in the accreditation process. This has relevance to this research particularly because the Advanced Certificate in Environmental Education is being implemented in line with recently-developed educational policy requirements of the South African government (e.g. *Norms and Standards for Educators* and *National Qualification Framework, RSA 2000*) and has been institutionalised within the Rhodes University Faculty of Education (Timmermans 2003).

The approach adopted by the *Gold Fields Participatory Environmental Education Course* views the teacher as both educator and learner (RUEEU 2002b:2) and this is in an attempt to internalise the civil society environmental education principles approved in Rio de Janeiro, Brazil in June 1992 (ICAE 1993). However, more recently a number of roles for educators have been developed for the South African education policy. These roles include, for example, the role of the educator as a mediator of learning, interpreter and designer of materials (RSA 2000:13). The development of additional roles for the educators seems to be a response to the

need for more scaffolding of learning and the requirements for learners to develop applied competence[4] as articulated by the South African the *Norms and Standards for Educators* policy statement (RSA 2000).

Another issue that seems significant to this research is the shift from a concern about 'resource materials' for learning to a perspective that is beginning to see and refer to these as 'learning support materials'. This is notable in the development of semi-distance courses as opposed to traditional contact (residential) courses and distance education (see Section 2.5). According to Molose (2000) many course developers and implementers had expectations of course materials as 'stand-alone' resources which seem to replace the educator in the learning process. Therefore, she recognises that the course materials are not the course but a part of it and suggests that educators should seek better and more appropriate ways to enable participants to engage with course materials in a more contextualised manner (Molose 2000). This has been recognised by the Course Development Network as a challenge that needs to be addressed through more responsive and context-based approaches to environmental education (Lupele 2003b). The Programme has also recognised the need to improve the development of learning support materials to be used in environmental education courses (SADC REEP 2002).

2.5. Materials development in southern Africa

Due to a growing concern with materials development in southern Africa, notably the shifts from RDDA (Research-Design-Disseminate-Adopt) to participatory approaches, the SADC Regional Environmental Education Programme started to focus on researching ways of addressing issues associated with materials development (SADC 1997). This concern led to the establishment of the Attachment[5] Programme as an opportunity for environmental education practitioners in the SADC region to spend ten days at Centres in the region to "… work on projects which may include development of new materials or adaptation of existing ones for use in their countries of origin" (SADC 1997:10). The SADC REEP was later tasked to support the development of capacity for materials and course development in the region (Parker & Murray 1999) and to support materials development at a national rather than at a regional level (Bakobi & Russo 2000). It was also required that the Programme should "… assist SADC member states to produce materials …" and not necessarily adopt the South African materials (SADC REEP 2002:36).

Much of this work has been undertaken at the SADC Regional Environmental Education Centre where despite its good results in providing participants with opportunities, time and materials for them to work on the

[4] Applied competence refers to the "… ability to put into practice in the relevant context the learning outcomes acquired in obtaining a qualification" (RSA 2000:7) and includes practical, foundational and reflexive competences (RSA 2000:10).
[5] The word 'Attachment' reflects the idea that people become 'attached' to 'something' (in this case attached to the SADC EE Centre and to its staff) for a certain period of time to develop further a particular programme, curriculum, project or learning material.

development and adaptation of their materials, a number of problems have been evident in the way materials were conceptualised, developed and used (see Section 2.5.1 below).

Problems associated with the **production and use** of learning support materials in environmental education courses have also been recognised in southern Africa (EEASA 2002). As a response to these problems the SADC REEP developed, in partnership with a number of environmental education practitioners, a regional sourcebook to support the development, adaptation and use of learning support materials (see Russo & Lotz-Sisitka 2003). In this sourcebook a number of issues associated with materials are identified. These issues are related to different trends associated with course and materials development (Russo & Lotz-Sisitka 2003). These trends include the shift from 'top-down' and 'expert-driven' approaches to materials development to more participatory approaches and recognition of 'mixing' approaches as a way of addressing the weaknesses and limitations of the 'top-down' and participatory approaches (Russo & Lotz-Sisitka 2003).

2.5.1. Different approaches to materials development

Approaches to materials development such as 'top-down' and 'expert-driven' are considered as some of early approaches which emphasised the role of the expert (as an authority) in deciding what should to be included in different materials and how these materials had to be used in different contexts (Russo & Lotz-Sisitka 2003). These approaches to materials[6] development are also known as RDDA (Research-Design-Disseminate-Adopt) approaches (Robottom 1987a) and are often used by 'experts' who believe that they have the knowledge for materials that will be adopted by teachers (Robottom 1987a; Taylor 1997). Such simplistic and rationalistic approaches argue that learning is linear and people (target groups) will change their attitude and behaviour if filled with information rigorously presented by scientists (*ibid.*). The RDDA proposes that materials:

> … should be developed by experts and disseminated to schools, communities and centres, where they are to be adopted and used by educators and learners. While RDDA approaches are often criticised for social engineering, they are often the most cost-effective, or time-effective approaches (which may explain why they are still popular, despite critiques of these approaches) (Lotz-Sisitka *et al* 2003:2).

A RDDA approach to materials development has been challenged by researchers engaged in materials development activities (Lotz 1996; Taylor 1997; Lupele 2003a). Taylor (1997:110) notes that it has failed "… to acknowledge the complexities involved if meaningful learning is to occur". This questioning has led to the development of different approaches including more participatory approaches to materials development that became widely used in southern Africa (Taylor 1997; Lotz-Sisitka *et al* 2003; Lupele 2003a; Russo & Lotz-

[6] Here I am considering materials in the form of course materials for mediated professional development initiatives as well as resources for learning interactions to foster better environmental learning and social change.

Sisitka 2003). One of the key features of participatory approaches to materials development, which seems to be a direct response to the imposition of RDDA approaches, is the need for democratic, consultative and collaborative processes that will enable the development of contextually relevant materials appropriate to the needs of specific learner groups (Russo & Lotz-Sisitka 2003).

Recent research has shown that participatory approaches to materials development have enabled the development of materials which are responsive to specific contexts and to environmental issues and risks (Lotz 1996; Mbanjwa 2002; Lupele 2003a). These participatory approaches seemed to have shaped action research initiatives which enable people to develop materials that will be used in processes of action-taking and problem-solving activities (Mbanjwa 2002; Lupele 2003a). Lotz-Sisitka *et al* (2003:4) note that in "… these processes, more people have become involved in establishing [and clarifying] frameworks for learning". Supporting a contextual engagement with materials has potential to enable "… environmental education processes in the region to become more deliberative, interactive and action-centred" (*ibid.*).

However, a naïve faith in participatory approaches has also shaped a shadow side that has been emphasised by a number of environmental education practitioners in the SADC region (Taylor 1997; Russo & Lotz-Sisitka 2003) where participation comes to be seen as an end in itself. This has led to problems related to the quality and use of learning support materials (Russo & Lotz-Sisitka 2003:9). The overemphasis on participation and its associated problems has led to a combination or 'mixing' of approaches to materials development that enables the development of more contextually relevant materials (*ibid.*). The 'mixing' of approaches seems to require "… a clearer view of the different roles that different people might play in developing and adapting learning support materials" (Russo & Lotz-Sisitka 2003:11-2).

2.5.2. Issues associated with materials development and use

There is evidence in the SADC region that there "… are problems regarding the production, distribution and use of relevant learning support materials for environmental education" (EEASA 2002:13) and therefore it was proposed that guidelines for the development and use of learning support materials be developed (*ibid.*). As mentioned previously, this has been partially addressed by the development of a regional sourcebook.

A number of research reports have also indicated the need for research on the use of learning support materials in contexts of professional development (Vinjevold 1999; Czerniewicz *et al* 2000; Lotz-Sisitka & Raven 2001). This is supported by Russo and Lotz-Sisitka (2003:12) who argue that in materials development the consideration of how the materials are going to be used is often neglected leading to the 'commodification' of learning support materials. In materials development, the lack of understanding on how materials should be

used in environmental education processes and the adoption of already-made diagrams seems to have implications to the role learning support materials play in fostering environmental learning either in professional development courses or as materials to foster environmental learning in a given context (*ibid*.). This seems to be supported by O'Donoghue and Russo (2003) who note that this lack of understanding on the use of materials has created an ambivalent space where materials development and the use of materials with groups of learners are not undertaken with clearly thought through propositions. The adoption of already-made diagrams and also of text can also have serious copyright implications (Russo & Lotz-Sisitka) and thus it seems important that in participatory processes of materials development/adaptation copyright issues are considered and original sources acknowledged (Taylor 1997).

It has been difficult to find relevant literature on the use of learning support materials. The available literature emphasises that, in the context of the South African National Environmental Education Project, the use of learning support materials is important to support professional development processes, to enable a better understanding of the environment and environmental education and to foster environmental learning (Lotz-Sisitka & Raven 2001:55). In another report, Vinjevold (1999:184) notes that there is a need to understand why materials (textbooks) are not used by educators when they are available. Czerniewicz *et al* (2000) suggest that the provision of learning support materials is not enough and that there is a need to provide professional development opportunities for educators to understand how to use learning support materials.

Evidence from the SADC Regional Environmental Education Programme shows that, in many cases, educators involved in materials development/adaptation initiatives often do not discuss and reflect on how and where the new materials will be used and fail to recognise the context and environmental issues in which the materials will be responsively used (O'Donoghue & Russo 2003). This often leads to the development of materials which are decontextualised from local realities and abstracted from contexts of use (*ibid*.).

The emerging issues (explored above) have enabled me to focus on aspects such as the adaptive use of learning support materials in context, workplace-based assignments and resource-based learning. These issues seem to have implications on how course participants engage learning support materials both in course materials and through the adaptive use of learning support materials in work contexts. Therefore, this seems an important aspect for the context of this research.

2.5.3. Towards clarifying learning support materials

Learning support materials have been defined in different ways and according to different contexts. For example, Vinjevold (1999:163) considers learning support materials as those materials that "… provide a

systematic learning framework …" while Czerniewicz *et al* (2000:20) propose a differentiation between **resources** (raw materials) and **learning support materials** (the resources in use with a pedagogical intent or purpose in ways which structure and support teaching and learning). This differentiation seems to be important in the context of this research because it provides a focus on the use of materials in teaching (with pedagogical intent) to foster learning. This is referred to as a process of **resource-based learning** and can take place on a course or within a course assignment where participants have to use materials and reflect on how they use the materials in their workplace context.

Environmental education practitioners in southern Africa note that learning support materials also signify a concern with the development, adaptation and use of materials (Lotz-Sisitka *et al* 2003; Russo & Lotz-Sisitka 2003). It is noted that "… when materials are developed in the field of environmental education, it is important to consider how these materials can be used to foster *environmental learning* [emphasis on original]" as a way of stimulating appropriate action-taking and problem-solving for social and environmental change (Russo & Lotz-Sisitka 2003:10). These new ways of seeing resources as learning support materials have the potential to influence the way course and resource materials are developed and used in environmental education processes to foster meaningful environmental learning in the SADC region. What seems evident from the above is that the resources are seen as learning support materials where the pedagogical dimensions of their use are made more explicit and course designs are increasingly recognising the importance of applying learning support materials in workplace-based contexts (O'Donoghue & Russo 2003).

Recognising the central role that learning support materials play in resource-based learning (Czerniewicz *et al* 2000), it becomes important to clarify processes of resource-based learning in the context of professional development.

2.6. Resource-based learning in professional development

Increased attention is being given to the role that learning support materials play in the implementation of professional development courses (Vinjevold 1999; Czerniewicz *et al* 2000; Janse van Rensburg & Lotz-Sisitka 2000; Lotz-Sisitka & Raven 2001; Russo & Lotz-Sisitka 2003). This appears to be in response to the complexity of environmental issues and risks, and to an identified need for adaptive use of learning support materials in workplace-based contexts. The relationship between learning support materials and professional development has also been identified as an important area of work and ongoing research (Vinjevold 1999; SADC REEP 2002).

The notion of lifelong learning has introduced new approaches to professional development, including the need for more flexible delivery options, a greater concern with applied competence, and a concern for relevance in the workplace (Raven 2003) as well as changes in the role of the teacher (Brown & Smith 1996; Relf 1996). Reasons for the emergence of resource-based learning include debates on the quality of teacher education (Taylor 1980; Leach 1996), the increase of learner numbers, moving away from traditional ways of course design and implementation, diversity of learners' background and the growth of new technologies (Robottom 1987a; Parsons & Gibbs 1994; Brown & Smith 1996; Relf 1996; SAIDE 1997). Resource-based learning, as an emerging discourse in environmental education, draws on a reflexive and flexible perspective on teaching and learning processes (Czerniewicz *et al* 2000) and seems to have emerged within recent trends in professional development that recognise the need for individuals to become lifelong learners.

These factors seem to have influenced the way professional development has shifted to include more engaging, responsive and contextualising educational processes. It is evident from the literature that there has been a shift from transmissive education (learners as passive consumers) to more active learning, leading to a change in the teacher's role (Brown & Smith 1996; Relf 1996).

The somewhat ambivalent term 'resource-based learning' seems to have its origins in distance education (SAIDE 1997), but in the context of the ACEE it is used as part of a semi-distance course that includes contact sessions and work-away (workplace-based) tasks with a focus on environmental learning. As in this case, a resource-based learning approach is increasingly being used in different contexts to describe a deliberating and engaging approach to improving teaching and learning processes (Czerniewicz *et al* 2000; DoE 1997; Janse van Rensburg & Lotz-Sisitka 2000; Lotz-Sisitka & Raven 2001). Thus, it has "… implications for the ways in which learning and teaching are conceptualised and practised" (Relf 1996:47). Some of these implications are related to the way learning support materials, which are central to resource-based learning, are used for meaning-making interactions in context. These implications have an influence on the role of the educator, on how learning takes place and how materials are used to foster learning (Czerniewicz *et al* 2000).

Resource-based learning is a social construct that appears to be specific to different areas of teaching and seems to vary according to the purpose and ideology of the educational intervention (Brown & Smith 1996; Relf 1996). According to Bleakley and Carrigan (1994:ix) resource-based learning may be described as "learning that actively engages students in using various resources …" to construct knowledge. Resource-based learning enables learners "… to take some responsibility for the learning process, and that challenges them to become lifelong learners" (*ibid.*:3). This can either be in interaction with course texts or during the use of materials in workplace-based assignments. Czerniewicz *et al* (2000:9) note that resource-based learning "… highlights the centrality of resources and indicates the complexity of overlapping skills, people and

attributes required", and this approach places an emphasis on learning through the use of materials (Dorrell 1993; Brown & Smith 1996). Instead of attempting to define resource-based learning, SAIDE (1998) developed some characteristics which state that resource-based learning is aimed at: moving away from a top-down transmissive type of education; learners becoming lifelong learners; and an effort to address learners' needs.

These perspectives seem to emphasise the notion of lifelong learners where individuals use materials and information to acquire skills and knowledge, and develop competences to respond to problems (Czerniewicz *et al* 2000). The development of such skills and knowledge, and its practical implementation, has been a concern for resource-based learning, particularly in relation to the roles of the educators in interpreting, mediating and designing materials with learners (Czerniewicz *et al* 2000; DoE 2002). These roles seem to have implications for how learners develop abilities to understand issues better, to do something by applying learning in context and to use reflections to inform their practice (RSA 2000). These abilities have been articulated as "applied competence" in the *Norms and Standards for Educators* (RSA 2000).

Molose (2000) and Raven (2003) indicate that in the context of professional development, the development of applied competence usually can be achieved through the implementation of workplace-based activities. These activities are usually considered as part of work-together (mediated learning) and work-away (including assignments) activities in which learners draw extensively on materials and learning from class interaction, to engage in the adaptive use of learning support materials in context (Molose 2000; Raven 2003). Learners' justification of choices and reflections are then used to inform practice leading to change or improvement of actions in context with learning support materials (Raven 2003).

Having discussed environmental education as a response to environmental issues and risks as well as the emergence of resource-based learning and the use of learning support materials in professional development activities it seems important to introduce the Rhodes University Advanced Certificate in Environmental Education (ACEE). As course developers began looking to develop better and more contextually relevant courses, it seems that they have started to introduce resources as learning materials in resource-based learning course designs. The ACEE seems to be such a case, thus it is used in this research as a useful example within which particular attention has been given to explore issues associated with course development and materials development based on a resource-based learning orientation.

2.7. The Advanced Certificate in Environmental Education

The Advanced Certificate in Environmental Education (ACEE) is a two-year semi-distance environmental education course offered by Rhodes University Environmental Education Unit. This course has been

developed to enable participants "… to develop the knowledge, skills and value orientations so as to respond to environmental issues and risks …" (RUEEU 2002a:4) with a particular focus on environmental education processes. This course enables the application of these skills and knowledge in educational contexts and settings other than schools (*ibid*.:2).

To achieve the above the ACEE course has developed a resource-based learning approach for Year One and a research-based implementation extension of this for Year Two. Resource-based learning in the ACEE is developed through four modules where learning support materials are used in learning-centred activities in particular contexts (RUEEU 2002a). This course was selected as a case study to explore characterising features of a resource-based learning approach to professional development. Part of this investigation will probe how the resource-based learning approach has been developed to enable and support environmental learning in different contexts. It will also involve an investigation into the relationship between course design and implementation and participants' experience of assignment implementation (see Chapter 5).

In the ACEE, a resource-based learning approach is used to explore "… how a range of learning support materials and other resources can be applied to support environmental learning in different contexts" and to improve participants' educational practice (RUEEU 2002a:4). In this course, the resource-based learning approach to professional development includes a strong focus on the use of learning support materials in a workplace-based context. The ACEE has been designed to strengthen the different roles that educators play (as defined by the Department of Education, RSA 2000), and to support participants on the course to show evidence of applied competence (RUEEU 2002a). This competence is developed through processes which enable participants to develop contextually relevant materials, to use them in learning situations and to reflect on and improve them in their own practice (*ibid*.). The course applies the understanding of applied competence as reflected in the *Norms and Standards for Educators* (RSA 2000) and includes:

- **Practical competence:** The ability to do something;
- **Foundational competence:** To have an understanding of what the participants are doing; and
- **Reflexive competence:** To apply participants' learning (to do something), to understand what was done and then based on that, be able to reflect and change actions as a result of these reflections in a particular context (RUEEU 2002a:3).

Drawing on Bleakley and Carrigan (1994), Czerniewicz *et al* (2000) and the orientation to the ACEE (RUEEU 2002a) it seems evident that resource-based learning approaches recognise the importance of materials (and information) in a context-based exploration and research (enquiry) where participants report results and experiences and this involves a narration of practice.

2.8. Concluding summary

This chapter presents a review of the broader contextual influences and perspectives within which the research of the ACEE was undertaken and gives emphasis to how the SADC Regional Environmental Education Programme has been responding to environmental issues in southern Africa. An orientation to the developments reviewed is provided which includes environmental education as a response to environmental issues and risks; professional development within environmental education processes; materials development and use; resource-based learning in professional development; and an orientation to the ACEE.

To locate this research I have provided some perspectives on the complexity of environmental issues and risks in southern Africa and how environmental education processes have emerged as a response to the environmental crisis. An overview of professional development is also provided to emphasise the role that professional development processes play in supporting environmental learning processes in southern Africa.

Recognising the role that learning support materials play in fostering and enhancing environmental learning, I described trends in the development and use of the learning support materials. I described this as 'resource-based learning' and traced the origins of the term to resource materials development as a separate concern becoming more centred on the materials supporting learning and being supported into use within professional development activities. I provided a description of trends towards lifelong learning which influenced course design and course implementation which led to the emergence of resource-based learning as a strategy for distance education. Here resource-based learning professional development has taken up a concern for the adaptive use of materials in context as well as giving attention to the design of the course materials. Based on this I have considered the resource-based learning and its application in the context of the ACEE.

I have also recognised the focus of the Programme's work in educational processes, its role in strengthening environmental education processes through enhanced and strengthened environmental education materials and training capacity and its engagement in developing more effective and meaningful approaches to open processes of teaching and learning. This has enabled me to identify opportunities for research which will inform the development of materials and courses in the SADC region.

Having considered the need for this research and reviewed the contextual influences and perspectives significant to this research, I will, in the next chapter, develop a discussion on a research design which will review the ACEE as a case of professional development that has adopted and developed a resource-based learning approach to foster environmental education processes.

CHAPTER 3 – RESEARCH DESIGN DECISIONS

3.1. Introduction

This chapter outlines the research design decisions made in the design of a research process for examining resource-based learning in the context of the Rhodes University Advanced Certificate in Environmental Education (ACEE). It describes the processes used to generate data relevant to the research focus, its aim and goals. In this chapter I describe the choice of drawing on an interpretive orientation to the research. In doing this I explain why and how a case study approach was used to probe a resource-based learning approach used in the Advanced Certificate in Environmental Education.

The way my perspective and understandings of the field of research have influenced both the choice of the research topic and the choice of the interpretive orientation to research is also discussed in this chapter. The techniques used for data generation as well as the process of data generation, analysis and interpretation are presented. The way I organised the data, how I dealt with validity and trustworthiness of the findings and ethical issues are also discussed in this chapter.

3.2. Research methodology

In trying to achieve the aim and goals of this research (see Section 1.4) I looked at how the professional development processes unfolded in the Advanced Certificate in Environmental Education by drawing on an interpretive orientation to research. I have done this by developing a case study of the ACEE (see Section 3.4) and following the four principles of research design as described by Durrheim (1999:33), which include:

- Outlining the purpose of the research (see Chapter 1 and Chapter 2);
- Developing a theoretical framework for informing the research (see Section 3.2.1);
- Probing the context in which the research was undertaken (see Chapter 2); and
- Using techniques to generate and analyse data (see Sections 3.3 and 3.5).

According to Durrheim (1999:33) these principles "… must be woven together in a coherent research design in a way that will maximise the validity of the findings". Recognising this I tried to develop a research design that is not only coherent and relevant to the aim and goals of this research, but also recognises that qualitative research is an iterative process that is open, fluid and changeable (Durrheim 1999). Within the context of research in an educational setting where situations are often changeable and highly affected by context

(Cohen *et al* 2000), an interpretive case study seems appropriate for developing an understanding of the characterising features of the resource-based learning approach.

3.2.1. Theoretical framework informing the research

The research methodology is centred on an interpretive orientation to research which recognises the importance of people's subjective experiences and its sensitivity to context (Terre Blanche & Kelly 1999) and seeks understanding of particular social settings (Neuman 2000). It is also influenced by particular ontological and epistemological[7] assumptions shaped by the contextual perspectives presented in chapter two. Drawing on an interpretive orientation I recognise that reality and meanings are socially constructed, and are modified and interpreted according to one's specific context (Cohen *et al* 2000). It is also evident that these meanings are re-shaped through ongoing processes of social interaction (Neuman 2000). I believe that it is in the understanding of such constructions and shared experiences that theory is embedded and multiple realities become evident and may be developed.

An interpretive orientation to research helped me to narrow and shape my initial aim and goals. According to Cohen *et al* (2000), this orientation to research enables the understanding of particular situations and contexts, and supports the ability to "… understand and describe meaningful social action" (Neuman 2000:85). In considering this framework and its implications to understanding and interpreting participants' subjective experiences in the Advanced Certificate in Environmental Education I am aware that:

- "[T]here are many interpretations of, and perspectives on, single events and situations … [and] reality is multi-layered and complex" (Cohen *et al* 2000:22); and
- It is possible to have multiple interpretations of social reality and as such interpretations are context-specific and can be ambiguous (Neuman 2000).

Recognising the above I tried to work closely with the research participants by sharing my interpretations with them and seeking clarification on the perspectives they have shared with me (see Section 3.6). This approach seems to be supported by Cohen *et al* (2000) who note that an interpretive framework to research recognises that the researcher works directly with individuals and their interpretations of their practice so as to develop theory with them and from the perspectives and experiences they share. They also consider that theory should emerge **from** the data arising in particular situations rather than **for** these situations (Cohen *et al* 2000). Data and interpretations are thus tied to the context of the research (Neuman 2000) and not open to generalisation.

[7] According to Terre Blanche and Durrheim (1999:6) ontology signifies "… the nature of reality that is to be studied, and what can be known about it" and epistemology represents "… the nature of the relationship between the researcher (…) and what can be known".

This seems to be relevant in the context of this research which examines how theory emerges from within the way course participants and tutors are engaged in resource-based learning (see Chapters 4 and 5).

With this research I intend to explain the process of resource-based learning without making major value judgments and without an explicit intention to initiate change. I intend to provide a worthwhile argument which can be used to inform educational decisions and environmental education practitioners (Bassey 1999). This seems to be consistent not only with the interpretive orientation to research but also with the 'practical knowledge interest' as described by Habermas (1972, cited in Grundy 1987:13).

The practical knowledge interest in this research is centred on understanding a particular situation (a case of a resource-based learning approach to professional development) through interpretive interactions and data generation with research participants (Habermas 1972, cited in Grundy 1987:14). According to Habermas (1974, cited in Cohen *et al* 2000:29) my research has a practical knowledge interest that "… seek[s] to clarify, understand and interpret …" a particular situation. These situations are often interpreted by drawing on interactions, the use of language and on the premise that reality is socially constructed (Berger & Luckmann 1966) and that "… people possess an internally experienced sense of reality" (Neuman 2000:72). In the research I also recognise that interpretation is often influenced by personal preferences, background and interests, and various social and contextual factors which are not fixed in time (Janse van Rensburg 2001). Thus, I have tried to not impose my personal interests either in the interpretation and analysis of the data or in presenting and discussing the findings.

In order to understand and interpret particular situations in specific contexts and because I am particularly interested in identifying the characterising features of a resource-based learning approach in the Advanced Certificate in Environmental Education, I chose an interpretive case study as a method for this research. This approach is explored further in the next section.

3.2.2. Case study approach

This case study is developed to explore and understand the particularity and complexity of a single case (Stake 1995; Bassey 1999). Case studies provide descriptive, rich information about specific situations and allow room for new ideas to emerge from the data (Lindegger 1999). This is the rationale behind having chosen this approach for this research.

Stenhouse (1988) argues that there are four styles of case studies, namely ethnography, evaluation, educational and action research. Considering the practical knowledge interest of this case study I am

presenting it as an educational case study where the researcher is concerned with the systematic narration of experiences or events (Stenhouse 1988; Bassey 1999). Stenhouse (1988) further argues that the purpose of educational case study is to improve educational practice which is consistent with the intention of this research in terms of developing more effective and meaningful approaches to professional development in the SADC REEP (see Chapter 1). Recognising this and the fact that the context is often fluid and dynamic, case studies seem to be appropriate to "… investigate and report the complex dynamic and unfolding interactions of events" (Cohen *et al* 2000:181).

This research used the stages for case study research as proposed by Bassey (1999) to explore interesting and significant features of a case. These stages are discussed below in relation to the data generation techniques, organisation of data and data analysis. They include identifying an issue to be explored; asking research questions and considering ethical issues; generating and organising data; summarising the data into analytical statements; interpreting the analytical statements and writing the research report (Bassey 1999).

This case study is descriptive in nature (narration of different accounts) as explained by Merriam (1988, cited in Cohen *et al* 2000:183). In this case, the narration of participants' accounts of the adaptive use of learning support materials in their workplace context is used (see case stories in Section 4.3). According to Cohen *et al* (2000) and Terre Blanche and Kelly (1999) in research that is informed by an interpretive framework, participants' experiences and their work context are considered. This has influenced in my choice of qualitative data generation techniques. As case studies "… involve the collection and recording of data about a case (…) and the preparation of a report" (Stenhouse 1988:49) I used three specific data generation techniques.

3.3. Data generation techniques

To generate data for this research I have used a number of data generation techniques. As case studies do not have specific techniques for data generation (Bassey 1999) I chose techniques that would assist in achieving the aim and goals of this research without compromising the social context. These data generation techniques included focus group interviews, semi-structured interviews and document analysis. Each data generation technique was used with a particular interest and with a specific group of research participants, as explained below, in relation to the three main goals of this research.

- *To investigate how course design and implementation enable resource-based learning processes.* This was investigated through analysing course materials, assignments briefs and tasks, and through conducting focus group interviews with the course developers and semi-structured interviews with the course participants (see Section 4.5).

- *To probe how tutors support the use of learning support materials in the Advanced Certificate in Environmental Education*. This was investigated through analysing course materials, assignments briefs and through conducting focus group interviews with the course tutors (see Sections 4.4 and 4.5).
- *To explore how participants engage in adaptive use of learning support materials in their work context.* This was investigated through analysing participants' assignments and course materials, and through focus group and semi-structured interviews with the course participants (see Section 4.4).

The initial planning and designing of this research as well as the use of the first data generation techniques were conducted at the Rhodes University Environmental Education Unit (RUEEU) in Grahamstown. The reason for this is that the course researched is offered by this institution and the access to course developers, course tutors and course participants was therefore practically possible.

All the focus group interviews were conducted at the Rhodes University Environmental Education Unit in Grahamstown between 30 September and 30 October 2002. The subsequent interviews (semi-structured interviews) were conducted in different venues (Rhodes University Environmental Education Unit in Grahamstown, Umgeni Valley Project in Howick and National Zoo Education Centre in Pretoria) according to the research participants' availability and were conducted between October 2002 and February 2003. I was able to visit certain participants' places of work and thus better understand the context in which their assignments took place.

In the next section I provide a more in-depth discussion on the use of the data generation techniques employed in this research. This is done with the intention to explain their importance in contributing towards the research process and the research aim and goals.

3.3.1. Focus group interviews

A focus group interview as described by Berg (1998) is a type of interview employed in small groups to obtain information from participants relevant to the research topic and was used as the first data generation technique. The rationale behind the use of this technique was guided by the need to explore "… the subjective experiences of people who have been exposed to the situation" (Merton & Kendall 1946, cited in Cohen *et al* 2000:290) as well as in enabling interaction and shared discussions amongst research participants (Berg 1998; Schurink *et al* 1998).

The focus group interviews were held with different research participants at different stages and summaries were developed (e.g. course participants – FGP1-3, course tutors – FGT and course developers – FGD).

These summaries were used for the first phase of data analysis and provided some early findings relevant for this research process (see Section 3.3.1.4).

The course participants (a total of eight) were randomly divided into different groups to collectively answer questions related to how participants engage in the adaptive use of learning support materials in their work context. The two course tutors and two course developers also formed part of focus group interviews which were conducted separately. The former group focused on how tutors support the use and application of learning support materials in the Advanced Certificate in Environmental Education and the latter on how the course is designed and implemented to enable resource-based learning. The data generated from the focus group interviews with the course tutors and course developers was later verified with documents such as orientation to the course, course materials (orientation texts and readings) and course assignments. The first focus group interviews were conducted with eight Advanced Certificate in Environmental Education course participants, followed by the two course tutors. The two course developers were the last group to be part of the focus group interviews due to availability of time and extensive commitments.

3.3.1.1. Conducting focus group interviews with course participants

In preparation for interviews I negotiated access with research participants (course participants and course tutors) by briefing them all during one of the ACEE contact sessions. The briefing was an explanation of the aim and goals of this research and the purpose of the focus groups in terms of data generation and obtaining relevant information for the research. The focus group interview was also used in order to encourage discussion between people from different backgrounds (Cohen *et al* 2000) on issues associated with participants' experience of resource-based learning in the ACEE, as well as to guide me in clarifying the procedure for the individual semi-structured interviews (Bogdan & Biklen 1992, cited in Cohen *et al* 2000:287). Questions of clarification were asked and informed consent[8] was obtained from all research participants. All participants agreed to be part of the research and also agreed to be interviewed later as individuals.

After scheduling dates, times and venues, participants were requested to randomly divide into three groups (of three) for the focus group interviews. One of the participants was away, so two groups of three and one group of two were formed. Research participants introduced themselves to me so we could get to know each other better and I also spent some time with them during sessions in order to become familiar with their work and backgrounds.

[8] This is described by Durrheim and Wassenar (1999) as people decide to voluntarily participate in a research process after receiving full and non-technical information about the research objectives and what is expected from them.

I decided to conduct focus group interviews with the course participants recognising that many of the issues to be discussed (especially the assignments) were implemented earlier in the year 2002, thus by promoting discussion in groups I was hoping that participants would remember their past assignments and also hoped that data would emerge from the group interactions (Cohen *et al* 2000). The focus group interviews proved to be a good way of addressing the above issue as participants were able to react and build on each others comments (Berg 1998; Schurink *et al* 1998) and thus make links with their past course activities. Another advantage of the focus group interviews was their open-endedness which allowed me to probe issues further (Berg 1998; Schurink *et al* 1998) and provided access to participants' intersubjective experience (Kelly 1999a).

As I wanted to explore assignments, I started the interviews with a discussion on their most recent assignment (Assignment 3) which involved a biodiversity study and then discussed a second assignment (Assignment 1) on an environmental audit. In doing this, I have recognised that the answers to my questions were socially constructed and these answers were shared reflections of the group (Berg 1998). The procedure for the focus group interviews was based on open-ended questions and all the participants had opportunities to:

a) Provide details on their work backgrounds
b) Discuss the Assignment of Module 3: Contemporary Environmental Issues (biodiversity study)
c) Discuss the Assignment of Module 1: Environment and Environmental Issues (environmental audit)
d) Provide general comments on the learning process

The focus group interviews took about 40 minutes and all the participants had similar opportunities to participate either voluntarily or were directed specific questions. The information on each interview was then summarised (with extracts of the interview being included) in the following format (see Appendix 1 for an example of an interview summary):

- Summary of self introductions
- Summary of the materials developed by course participants
- Summary of the use of the assignment guidelines
- Summary of the course activities prior to the assignment
- Summary of the usefulness of the resource pack
- Summary of the most valuable experience
- Final comments (the learning process)
- Notes (other general comments)

The summaries (FGP1, FGP2 and FGP3) of all focus groups interviews were given back to the respective groups for correction, adequacy and respondent validation[9]. All the participants from the different groups were, in general, satisfied with my summaries and grouping of ideas and some participants sent comments or clarifications. A summary of the main points of these focus group interviews (AM1, see Appendix 2) combined with information from other sources provided an initial diagrammatic representation of a possible framework of resource-based learning in the ACEE (see Section 4.2.2). The data from these focus group interviews was also combined with data from the semi-structured interviews and course assignments to develop three individual case stories of participants' experience in adaptive use of learning support materials in different settings (see Section 4.3).

Similarly, the data generated through the focus group interviews with the ACEE course participants was then triangulated and compared with other case-related data (particularly with the assignments), to clarify how participants are engaged in adaptive use of learning support materials in their work context and to guide the follow up semi-structured interviews with participants. This is supported by Berg (1998:105) who suggests that focus group interviews can "… produce substantially less data than individual interviews" and thus should be used in combination with other techniques. In this case I have combined focus group interviews with semi-structured interviews and document analysis.

3.3.1.2. Conducting focus group interviews with course tutors

This data generation technique was used with two course tutors in order to investigate how tutors support the use of learning support materials in the ACEE. The two course tutors were briefed on the purpose of the focus group interview and a background on the process so far was provided. The questions (see Appendix 3) were developed from earlier readings of the course materials as well as from the outcomes of the focus group interviews with the course participants. I noted that participants were not clear about the concept of resource-based learning, how it was reflected in the course and the explanation of the assignment process seemed to be superficial, I therefore developed questions for the course tutors to provide insight into such issues.

In a similar process to the data from the course participants, the data generated in this focus group interview was summarised (FGT) rather than transcribed. The reason for doing this was the fact that by summarising the data from all the focus group interviews I was already analysing it to inform the next interviews. Summarising seemed very important in this research, especially because by doing this I was able to start identifying some of thematic categories of the research (Cohen *et al* 2000) (see Section 3.5.2).

[9] Cohen *et al* (2000) note that respondent validation can be very useful because when the research participants check for accuracy of the data. They might, in addition, provide additional comments or suggest better ways of expressing their points (*ibid*.).

The analysis of the data from the focus group interviews with course tutors was influential in developing the questions for the focus group interviews with course developers. For example, after summarising the initial data I noticed that the role of the tutor in the course and the kind of materials provided as part of resource-based learning were not clear enough, thus specific questions were included in the interview schedule to explore this issue. The data analysis was also used to provide more insight into an initial diagrammatic representation of a possible framework of resource-based learning in the ACEE (see Section 4.2.2).

3.3.1.3. Conducting focus group interviews with course developers

In order to investigate how the course design and implementation enables a resource-based learning approach I held focus group interviews with the two course developers. As in the case of the course tutors, the questions (see Appendix 4) used were developed from earlier readings of the course materials as well as from the outcomes of the focus group interviews with the course participants and course tutors. The two course developers were briefed on the objectives and purpose of this focus group interview.

The data that emerged from the focus group interview with the course developers was summarised (FGD) and analysed with the view to inform the characterising features of resource-based learning as well as to provide insights into how the course design and course implementation has enabled resource-based learning in the ACEE. These data have also enabled the development of an initial diagrammatic representation of a possible framework for resource-based learning in the ACEE (see Figure 4.1).

3.3.1.4. Outcomes of phase one of data analysis

I considered phase one of data analysis the summary and analysis of the data generated through the focus group interviews with the three different groups (participants, tutors and developers). These data were useful in informing further data generation (e.g. guiding the procedure for the semi-structured interviews) as well as in providing emerging patterns of resource-based learning in the ACEE. These preliminary emerging patterns are presented in a diagrammatic representation (see Section 4.2.2 and Figure 4.1) and should only be considered as an initial attempt to describe resource-based learning in the ACEE. These data were later triangulated and extended with other case-related data through the use of semi-structured interviews and document analysis.

3.3.2. Semi-structured interviews

Semi-structured interviews are used as a natural form to interact with people in data generation processes (Terre Blanche & Kelly 1999) and because they are sufficiently open-ended to enable questions to be re-

ordered, expanded and further probing can take place (Cohen *et al* 2000). This technique, to probe and clarify the characterising features identified in the focus group interviews, was subsequently used, through triangulation[10] with other data sources to compare with and extend other characterising features of the resource-based learning approach used in the Advanced Certificate in Environmental Education. These semi-structured interviews were conducted with three ACEE course participants with a view to clarify and deepen the data generated in the focus group interviews, particularly in relation to their two assignments on Module 1 (environmental audit) and Module 3 (biodiversity pack).

The three ACEE course participants were chosen based on purposive sampling (Kelly 1999a) by identifying research participants with particular characteristics. For this I have drawn on a selection criterion evolved from the data from the focus group interviews. Although participants' work context and experience were considered to obtain a wider diversity of work contexts, participants were also selected based on their participation in the focus group interviews and interest in materials development. The three participants selected represent the non-formal sector of education, private sector and public/governmental sector. The three course participants were informed of the choice and the criterion used in selecting them. After explaining why they had been chosen course participants were requested to be individually interviewed about the way in which they had developed their assignments. I also requested a copy of their assignments so I could compare and triangulate them with the data from the focus group and semi-structured interviews. This was agreed by the participants and I received copies of their two assignments.

I was also interested in interviewing research participants in their work context as this would provide me with more insights on the places in which their assignments were developed and implemented. Therefore I conducted the semi-structured interviews in their work contexts. For ethical reasons participants' names were replaced by pseudonyms (see Section 3.7). For the first interview I travelled to Grahamstown and used the Rhodes University Environmental Education Unit to interview Joan, an environmental freelancer with an interest on materials development representing the private sector (INT1). For the second interview I went to the National Zoo in Pretoria to visit Abel, an education officer representing the public/government sector (INT2) and lastly I interviewed Zola working as an assistant for the Gold Fields Environmental Education Service Centre in Umgeni Valley in Howick representing the non-formal education sector (INT3).

The three interviews took place in different venues and at different times to accommodate the availability of the research participants. Each participant was requested to describe the process of developing their assignments. I used semi-structured interviews as a data generation technique to probe further issues raised

[10] I have considered triangulation as a process of data confirmation that it "… entails collecting material in as many different ways and from as many different sources as possible" (Terre Blanche & Kelly 1999:128) as well as for the purpose of completeness as a way of understanding data by adding depth and breadth to the research findings (Arksey & Knight 1999).

by each participant. The semi-structured format assisted participants with remembering and structuring responses.

For the purpose of data analysis and to provide a clear structure of what they were saying I have summarised these interviews (according to the two assignments on environmental audit and biodiversity pack) which, combined with the data from the focus group interviews and participants' assignments, was used to develop three individual case stories of course participants engaged in the adaptive use of learning support materials in their workplace context. These summaries (INT1, INT2 and INT3) were given back to the three people interviewed for checking and respondent validation (Cohen *et al* 2000).

3.3.2.1. Outcomes of phase two of data analysis

I have considered phase two of data analysis as the summary and analysis of the data generated through the semi-structured interviews with the three research participants. The data that emerged from such summaries, combined with the data from the focus group interviews, was valuable in helping to construct three individual case stories (see Section 4.3). These data, combined with the analysis of participants' assignments (see Section 3.3.3), have also enabled me to develop four thematic categories based on the participants' experience of assignment work (see Section 3.5.2).

3.3.3. Document analysis

This technique was used to collect data from written sources and documents used in social and educational research (Hitchcock & Hughes 1995). In the case of the Advanced Certificate in Environmental Education these sources and documents included orientation texts (which provide an orientation to each module), readings (articles and papers with relevant information for each module), learning support materials (in the form of resource packs to support the assignments), participants' assignments and other course materials. In order to obtain a better understanding of the course design and course implementation these sources and documents were summarised in a comparative table (CT, see Appendix 5).

These source and documents were used in three different ways, firstly to provide an in-depth understanding of the course design and course implementation, secondly to clarify the relationship between the course design and course assignments, and thirdly as a way of triangulating and extending the data generated from both the focus group interviews and semi-structured interviews.

3.3.3.1. Outcomes of phase three of data analysis

The insights and thoughts derived from the document analysis process were summarised in analytical memos[11] (AM2-4, see Appendices 6, 7 and 8). These analytical memos were useful in detailing and refining the data and in establishing thematic categories for course design and implementation, and participants' experience of assignment work (see Section 3.5.2). The documents, particularly participants' assignments, were important in making more explicit some of the participants' experiences of assignment work which were only superficially dealt with in both focus group and semi-structured interviews, thus enriching the construction of the three individual case stories. The findings of each thematic category are presented in Chapter 4 (see Sections 4.4 and 4.5) and are used to support the discussion of the findings in Chapter 5 on the characterising features of resource-based learning.

3.4. Organisation of the data

In this research the organisation of the data is considered to be an integral part of the data analysis (Poggenpoel 1998; Arksey & Knight 1999) and for this purpose I have chosen different ways of organising the data in a systematic and coherent way. As most of the initial data were generated from focus group interviews and semi-structured interviews and audio-recorded, tapes were catalogued according to date, venue, technique used and people involved (Bassey 1999). Diary notes were also used to capture instances and thoughts relevant to meet the aim and goals of this research (Arksey & Knight 1999). Photocopies of participants' assignments were kept in lever archer files. Extra copies of the assignments and course materials were made for the purpose of manual coding to establish thematic categories. Coding is often used for focused and smaller data sets (Poggenpoel 1998; Arksey & Knight 1999), and for manual data reduction and analytic categorisation (Neuman 2000). In the case of this research it has proved to be useful in avoiding an overload of data and in identifying the main thematic categories from the data.

To ensure accessibility of the data (Poggenpoel 1998) all the transcribed and summarised data, both from the audio tapes (organised according to the focus group interviews, semi-structured interviews and documents analysed) and diary notes, were kept in computer files. Another advantage of using computer files is the fact that these can allow the use of codes and labels, making it possible to add comments and notes as well as providing a platform that allows grouping and regrouping of data (Poggenpoel 1998; Terre Blanche & Kerry 1999).

[11] Analytic memos are used as techniques to refine data and create links between the data and more theoretical thinking (Neuman 2000) as well as to condense the data into meaningful and trustworthy statements or categories (Bassey 1999).

In transcribing and summarising the data I tried to keep it as close as possible to the reality, recognising that there is no single 'correct' way of transcribing interviews and also that these can be abstracted and decontextualised from social processes (Cohen *et al* 2000). In many cases I have included full transcription (or extracts from the interviews) of points made by the research participants which illuminated and illustrated issues associated with the thematic categories developed in this research. By doing that I was ensuring that the thematic categories were rooted empirically in the data (Arksey & Knight 1999).

As mentioned earlier analytic memos were also used "… in order to identify particular theoretical themes and concepts which have evolved in the course of the research …" (Poggenpoel 1998:335) and these proved to be useful in establishing common thematic categories (see Section 3.5.2). As noted by Poggenpoel (1998:335 drawing on Schurink 1996) these thematic categories inform the structure of the research report and in this research they have informed the structure of Chapter 4. The analytic memos, interview summaries and thematic categories have enabled me to become familiar with the data, reduce the data to manageable parts and initiate data analysis and interpretation.

3.5. Data analysis and interpretation

According to Terre Blanche and Kelly (1999) in an interpretive orientation to research the researcher is often the main instrument in collecting and analysing the data and for this certain interpretive and analytical categories are developed throughout the research as a way of facilitating the data collection and data analysis. This has influenced the way data were analysed in this research. Another important aspect of data analysis is the interpretation of it and in this research I have recognised that interpretation can often be partial as "… it can never give the full picture, never reveal all the layers of meaning" and it is often based on a certain position or viewpoint of the person interpreting the information (Janse van Rensburg 2001:34). As a way of addressing this problem I considered interpretation as a meaningful process of data interpretation which is closer and true to the data. For this it was important to recognise that as data were being generated they were also being analysed (Bassey 1999).

As explained above, the data generated was continuously analysed, with a view to inform and guide the subsequent data generation processes (Neuman 2000) as well as to clarify and deepen insights into the characterising features of the resource-based learning approach in the Advanced Certificate in Environmental Education. I also tried to work with the research participants in the construction of the three individual case stories by providing them with my constructs of what research participants shared with me during the focus group, semi-structured interviews and from their assignments (Poggenpoel 1998).

Although each data generation technique was used with specific purposes and with research participants in relation to the goals of this research, each technique contributed towards clarifying similar outcomes as illustrated in the table below (Table 3.1, which also provides an indication of the data techniques and data sources used for the data analysis). The combination of these outcomes was useful in identifying the characterising features of a resource-based learning (RBL) approach in the Advanced Certificate in Environmental Education (see Chapter 5).

Table 3.1. Summary of outcomes of data analysis

Data Techniques	Data Sources	Codes	Outcomes
Focus group interviews	Eight course participants	FGP1; FGP2; FGP3; AM1	Diagrammatic representation of resource-based learning (RBL) in the ACEE
Semi-structured interviews	Three course participants	INT1; INT2; INT3	Three individual case stories
Document analysis	Course materials and participants' assignments	AM2; AM3; AM4	Insights on participants' experiences of assignment work
Focus group interviews	Two course tutors	FGT	Diagrammatic representation of RBL in the ACEE
Document analysis	Course materials and assignment briefs	AM 2; AM 3; AM 4	Insights on course development and course implementation
Focus group interviews	Two course developers	FGD	Diagrammatic representation of RBL in the ACEE
Semi-structured interviews	Three course participants	INT1; INT2; INT3	Insights on participants' experiences of assignment work
Document analysis	Course materials and assignment briefs	AM2; AM3; AM4	Course design and course implementation

3.5.1. First layer of data analysis

Recognising the above I developed three layers of data analysis. The first layer was related to clustering the data from the focus group interviews in an attempt to develop a diagrammatic representation of the resource-based learning approach in the Advanced Certificate in Environmental Education. This was a means of organising the data and would inform the next phase of questions (Terre Blanche & Kelly 1999; Neuman 2000). The early diagrammatic representation of the resource-based learning will be discussed in Section 4.2.2 (see Figure 4.1).

In an interpretive orientation to research, it is difficult to define when data generation stops and data analysis starts, which usually commences during the data generation process (Terre Blanche & Kelly 1999; Cohen *et al* 2000; Neuman 2000). I therefore decided to do an initial superficial analysis[12] of the first set of focus group interviews (with course participants) so as to inform the questions for second focus group interviews (with course tutors). This helped to formulate questions for the third focus group interviews (with course developers). Similarly the data that emerged from the focus group interviews were analysed to provide insights into the semi-structured interviews conducted with three course participants.

3.5.2. Second layer of data analysis

The second layer of data analysis was undertaken by looking at the data relating to the course design and course implementation, and the data associated with the participants' experience of assignment work. These sets of data included the course materials (orientation texts, readings and resource packs), the different focus group and semi-structured interviews and participants' assignments. This was done with the purpose of clarifying how the course is designed and implemented to enable resource-based learning and as a way of understanding how participants are engaged in adaptive use of learning support materials in their workplace context.

Neuman (2000:420) notes that qualitative researchers often analyse dada by organising it "… into categories on the basis of themes, concepts, or similar features". Thus, during the first layer of data analysis certain patterns emerged from the data which were consistent with the research aim and goals (Poggenpoel 1998). I therefore developed two sets of thematic categories. This is supported by Terre Blanche and Kelly (1999:141) who suggest that thematic categories should "… ideally arise naturally from the data, but at the same time they should also have a bearing on your research question".

The first set of thematic categories is related to the participants' experience of assignment work and will be discussed in see Section 4.4. The three individual case stories (see Section 4.3) developed based on the different available data (interviews and documents) assisted me in establishing these thematic categories which are presented below:

- Focus on context;
- Adaptive use of learning support materials;
- Narration of practice; and

[12] According to Schensul and Schensul (1991 cited in Lotz 1996:99) a superficial data analysis can "… contribute immeasurably to its interpretation because of familiarity with the context of the project".

- Assignment support.

The second set of thematic categories is related to course design and course implementation and which will be discussed in see Section 4.5, includes:

- Course orientation;
- Course materials;
- On-course tasks and activities; and
- Assignments and work-away tasks.

3.5.3. Third layer of data analysis

Subsequent to the analysis of the data elicited from the focus group interviews, semi-structured interviews and document analysis, the findings and significant features of this research are shared based on a descriptive narration of the three participants' case stories of adaptive use of learning support materials in workplace-based contexts. In these case stories I tried to provide a rich, 'thick description' of the "… characteristics, processes, transactions and contexts …" (Terre Blanche & Kelly 1999:139) of a resource-based learning approach evident in the Advanced Certificate in Environmental Education.

According to Tesch (1990, cited in Poggenpoel 1998:345) in data analysis the researcher needs to identify the relationships existent between the major categories. Thus, in the third layer of data analysis I analysed the similarities and differences between the thematic categories presented above to identify the characterising features of a resource-based learning approach (see Chapter 5). This is done through a careful and detailed analysis of the data relating to course design and course implementation, and participants' experiences of assignment work. This analysis, as suggested by Bassey (1999:70), was condensed into analytical statements (see Appendix 9) "… which give concise answers to the research questions … [and] are in accord with the data".

Tutor and course developers' perspectives on the course design and implementation as well as the comparative table of course materials for the two modules researched (CT, see Appendix 5) were used to expand and illustrate the characterising features of a resource-based learning in the Advanced Certificate in Environmental Education. All these data was analysed to provide insight into issues relating to course design and course implementation to enable resource-based learning in professional development courses (see Chapter 5).

3.6. Validity and trustworthiness

In the context of this research I used data and methodological triangulation by using multiple techniques (interviews, document analysis) and by consulting different sources (course materials, reports, assignments) (Lynch 1996; Arksey & Knight 1999; Kelly 1999b; Terre Blanche & Kelly 1999). This method was also used to ensure the rigour and trustworthiness of data and interpretations (Fien 1992, cited by Lotz 1996:104) and as a self-monitoring process allowing the researcher to use different data sources and techniques (Lotz 1996; Lynch 1996). Another aspect used to ensure the validity and trustworthiness of the data through triangulation was the verification of the data generated through the focus group interviews with follow-up interviews and with an analysis of participants' assignments and course materials. According to Lynch (1996:62) triangulation should not be used as a technological solution but as a "… technique which provides more and better evidence from which researchers can construct meaningful propositions about the social world". This argument has guided me in the construction of the diagrammatic representation of resource-based learning as well as in the development of the three individual case stories.

According to Lincoln and Guba (1985, cited in Poggenpoel 1998:349) a research study is credible when multiple realities revealed by the research participants are adequately and accurately represented. I have tried to achieve this by using respondent validation, where research participants are required to confirm their responses (Cohen *et al* 2000), particularly with the focus group interviews and semi-structured interviews and the case stories developed in this research process. To validate the data and knowledge created, a process of interpretation, re-interpretation, and self-correction of data with the research participants was used. Here, my interpretations of participants' experiences in the ACEE were re-interpreted and extended by the research participants and ambiguities were self-corrected by the different data sources I had available. In relation to this Kamarovsky (1981, cited in Lather 1986:65) notes that to ensure data trustworthiness and credibility we need to use self-corrective techniques which will minimise the misrepresentation of our personal interpretation.

Maxwell (1992) provides some advice in terms of different strategies to ensure validity in qualitative research which I have adhered to. Thus, I drew on Maxwell's (1992) category of descriptive validity by providing factual and accurate description of the data and by not omitting any information that research participants felt to be important for their case story. When constructing the three individual case stories I used Maxwell's (*ibid.*) category of interpretive validity by using the language and concepts employed by the participants in the interviews in the situation being studied. Maxwell (*ibid.*) further suggests that such stories are always constructed by the researcher based on participants' accounts (interviews) and other evidence (participants' assignments), and should be as 'experience-near' as possible (Geertz 1974, cited in Maxwell 1992:289).

Another category to ensure validity and trustworthiness which is significant for this research is described by Maxwell (1992:291) as theoretical validity which "… goes beyond concrete description and interpretation and explicitly addresses the theoretical constructions that the researcher brings to, or develops during, the study". Maxwell (*ibid.*) further argues that theoretical validity refers to "… an account's validity as a *theory* [emphasis on original] of some phenomenon" (the Advanced Certificate in Environmental Education). Maxwell (*ibid.*) considers that any theory has two components namely the categories that the theory employs (set of thematic categories for course design and course implementation, and participants' experience of assignment work, see Chapter 4) and the relationship between these set of categories (see Chapter 5). Thus it is important to consider the validity of this set of categories when applied to the ACEE as well as the validity of the proposed relationship between these categories. According to Maxwell (*ibid.*) it is important to ensure "… the validity of the blocks from which the researcher builds a model [diagrammatic representation of resource-based learning] as these are applied to the setting or phenomenon being studied [the ACEE]".

In addition to the above I also followed the advice from Lincoln and Guba (1985, cited in Bassey 1999:75-7) by spending a considerable amount of time with the data, focusing on particular features of the case and by keeping a systematic record of the data and research process. A prolonged engagement with the interview summaries, analytic memos and my notes (Guba & Lincoln 1989, cited in Lynch 1996:57) contributed towards my familiarity and understanding of the data. These techniques have enabled me to stay close to the data and were important in providing cross-referencing with the data in the discussion of research findings (Bassey 1999). I have also drawn on self-reflexivity (Lather 1996) in an attempt to review and correct any personal assumptions and interest that might have affected the outcomes of this research.

As case studies are interested in studying singularities or particular cases, they cannot necessarily be generalised (Bassey 1999). However, Bassey (1999:52) further argues that 'fuzzy generalisations' from case studies can be made especially in educational research. He notes (*ibid.*) that although 'fuzzy generalisations' have an element of uncertainty they "… should be seen as tentative 'approximation of the truth'" (Bassey 1999:56). Thus, I am also aware that the recommendations made within this research (which may be relevant for the next ACEE and for course development in the SADC REEP) may be read, interpreted and used by other people in different ways. As noted by Bassey (1999:52) a 'fuzzy generalisation' reports "… that something has happened in one place and that it *may* also happen elsewhere" [my emphasis].

3.7. Ethical issues

Ethical issues were also carefully considered in this research through negotiating access with course developers, tutors and participants based on the 'informed consent' principle by giving them full information of

the research process and objectives, clarifying their roles and making sure that they understood the nature of the study (Cohen *et al* 2000). At the start of, and throughout the research process, research participants were able to provide comments, extend and correct data summarised from their interviews (both focus group and semi-structured interviews). The three case stories were constructed together with the research participants who through respondent validation where able to make the necessary corrections and additions.

I have also considered the three ethical principles (autonomy, nonmaleficence and beneficence) described by Durrheim and Wassenaar (1999). This was done by respecting the autonomy of all people participating in the research to withdraw at any stage of the research and also by guaranteeing their anonymity, by using pseudonyms, in any publication arising from the present research. The nonmaleficence principle (Durrheim & Wassenaar 1999; Cohen *et al* 2000) was also carefully considered as research participants would not be the objects of any social, emotional, physical or any other form of harm. Regarding the last ethical principle, beneficence, it is hoped that the research community and society at large will benefit from the outcomes of this research.

Of relevance for this study were the three research ethics principles suggested by Bassey (1999) for case study research. The first principle which calls for respect for democracy gives the researcher the freedom to ask questions, give and receive information and publish the research findings. However, this ethical principle is intrinsically linked to two other principles namely, respect for truth and respect for persons (Bassey 1999). The former requires truthfulness from the researcher in terms of data collection, analysis and reporting findings and the latter recognises the need to respect research participants who are entitled to dignity and privacy.

According to Cohen *et al* (2000) anonymity is normally used when the outcomes of the research are used for generalisations and in case studies it is not advisable to use anonymity. This is supported by Bassey (1999:78) who argues that anonymity "… is not necessarily the best approach …" in case study research. In this research I used pseudonyms for the research participants' names but with their consent their work context was not concealed. The main reason for this is the fact that a rich, thick description of their work context is very important for this research. This is supported Geertz (1973:241, cited in Lynch 1996:67) who describes thick description as "… an extensive and careful description of time, the place, the context …" from which the data have evolved.

3.8. Concluding summary

This chapter placed emphasis on the theoretical framework informing the research as well as the context in which the research was undertaken. I have also described how I made research design decisions with a view

to fulfilling the aim and goals of this research and have explained the reasons for choosing an interpretative case study (Stake 1995; Bassey 1999). This was guided by the interest to develop an understanding of the characterising features of resource-based learning approach in the Advanced Certificate in Environmental Education (ACEE). To provide rich and descriptive information about the resource-based learning approach in the ACEE was also a rationale for having chosen case study approach.

As this research adopts an interpretive orientation to research I am concerned with the understanding of situations in a particular social setting (Cohen *et al* 2000; Neuman 2000). Through the interpretation of the data, I developed a number of thematic categories to identify the characterising features of resource-based learning in the Advanced Certificate in Environmental Education. By using this orientation to research I recognise that social reality and meanings are socially constructed, modified and interpreted according to my understandings which are in turn re-shaped through ongoing processes of shared meaning-making with research participants (Cohen *et al* 2000; Neuman 2000).

For the development of this case study and identification of certain thematic categories, a number of data generation techniques were employed. These included focus group interviews, semi-structured interviews and document analysis. A detailed explanation of how these techniques were used and of the outcomes of the data generated through these techniques is provided. These outcomes emerged from three layers of data analysis and interpretation (Cohen *et al* 2000). The first layer was used to develop a diagrammatic representation of resource-based learning approach in the ACEE as well as to inform further data generation questions. From the second layer of analysis emerged two sets of thematic categories for course design and course implementation, and for participants' experience of assignment work. The third layer of analysis drew on the outcomes of the first two layers and analysed the similarities and differences between the thematic categories presented above to identify the characterising features of a resource-based learning approach.

To ensure validity and trustworthiness in this research I have used a number of techniques suggested by a number of social researchers, notably Lincoln and Guba (1985, cited in Bassey 1999), Maxwell (1992), Arksey and Knight (1999) and Kelly (1999b). These techniques include data and methodological triangulation, the development of careful and systematic records of the research process and research findings, theoretical validity, spending a considerable amount of time with the data and a thick description of the case stories.

Drawing on the recommendations from Durrheim and Wassenaar (1999) and Cohen *et al* (2000) I considered a number of ethical issues related to the research process, with emphasis to the principles of autonomy, nonmaleficence and beneficence as well as the principle of informed consent. I have also drawn on the three ethical principles suggested by Bassey (1999) for case studies, namely respect for democracy, respect for

truth and respect for persons. To ensure some degree of anonymity I have replaced the real names of the research participants with pseudonyms.

Having explained the generation, management, organisation and analysis of the data, in the next chapter I will share the different research findings that have emerged during this research process.

CHAPTER 4 – PRESENTATION AND DATA ANALYSIS

4.1. Introduction

As explained in Chapter 3, each layer of analysis informed further data collection as well as the establishment of thematic categories. This chapter presents findings that emerged from each layer as reflected in the diagrammatic representation of resource-based learning in the Advanced Certificate in Environmental Education (see Section 4.2.2 and Figure 4.1). This was constructed from focus group interviews and document analysis and as the research process progressed course documents were analysed and course participants interviewed, allowing three individual case stories to be developed and reviewed (see Section 4.3). From these, insights on participants' experiences of assignment work (see Section 4.4) as well as on course design and course implementation (see Section 4.5) were developed. Developing insights were then categorised in two thematic categories. For the purpose of analysis these two thematic categories are treated separated with the recognition of their interrelatedness. In Chapter 5 these data are examined as a whole to probe characterising features of resource-based learning in the ACEE as a professional development course.

The findings derived through analysis of the three layers of data are then discussed in relation to the research goals. The findings are thus evidence-based, illustrated with data providing links between method, theory and results evident in the research process (Robottom & Hart 1993). The sections that follow present detailed accounts of the findings of the research process outlined above.

4.2. Data analysis informing data generation

The initial data were generated through focus group interviews with course participants, tutors and developers. As explained earlier (see Section 3.3.1.1) the data emerged from the focus group interviews informed further data generation activities. As I was summarising and analysing the data from the first focus group interview I realised that information about how the on-course tasks have helped participants' assignment work[13] was not emerging. Thus, in the two subsequent focus group interviews an additional question was included to generate these data. Furthermore, after having summarised the data from the focus group interview with the course tutors I became aware that information on the tutors' role as well as on the kind of materials provided as part of resource-based learning was not evident. Based on this finding I subsequently included specific questions for the course developers that would help me in obtaining such data (see Appendix 4).

[13] The term 'assignment work' is used to describe the assignment process undertaken by the ACEE course participants. This process included research in context; selection of relevant materials; development and adaptation of materials; fieldwork and implementation of the materials with learners; and reporting.

The data from all the focus group interviews was reviewed to clarify the procedure for the semi-structured interviews that followed. Rather than developing a rigid interview schedule I decided to ask some specific question and then requested each participant to describe the process that they went through while undertaking their assignment work. I chose this procedure because I wanted participants to draw on their experience to present information on the experience of resource-based learning on course as well as the assignment activities. I hoped that this approach would help participants to speak freely about these processes and my intervention would be limited to probing issues or areas that I found to be superficially discussed.

The analysis of the three focus group interviews was later summarised in an analytic memo (AM1, see Appendix 2) using a format that emerged within the data (see Section 4.2.1 below). This analytic memo together with the comparative table for the two modules (CT, see Appendix 5) has enabled the development of an initial diagrammatic representation of resource-based learning in the ACEE (see Section 4.2.2 and Figure 4.1. below). The two modules analysed included Module 1 on *Environment and Environmental Issues* (MOD1) and Module 3 on *Contemporary Environmental Issues* (MOD3).

4.2.1. Summary of participants' focus group interviews

When summarising the focus group interviews conducted with course participants I grouped the information according to the areas of response. This was done to clarify the resource-based learning, particularly in relation to the assignment work undertaken by the ACEE course participants for Assignment 1 (environmental audit) and Assignment 3 (biodiversity study).

In Assignment 1, course participants were required to conduct an environmental audit to identify environmental issues in a local context of their choice. For this they were asked to design an audit sheet or questionnaire to be used in the activity. In Assignment 3, course participants were expected to develop an educational pack for supporting learners in exploring and responding to local biodiversity issues. They were requested to focus on a plant or animal that is rare or endangered in their particular context. For further understanding of the assignment tasks, a comparative table of the two modules and assignments was developed (see Appendix 5).

Below I present summaries of the main issues highlighted by the course participants. These are organised into six areas of response:

- Materials developed by course participants;
- Use of the assignment guidelines;

- Course activities prior to the assignment;
- Usefulness of the resource pack;
- The most valuable experience; and
- Comments on the learning process.

- **Materials developed by course participants**

A wide variety of materials were developed by the course participants during their assignment work. These included environmental fact sheets, flyers, posters, games and activities for Assignment 3 (biodiversity) and questionnaires, worksheets and audit sheets for Assignment 1 (environmental audit).

The diversity of materials seems to be associated with the different orientations to the assignments (see Appendix 5). For example, in Assignment 1 participants received samples of audit sheets and questionnaires (MOD1) while in Assignment 3 participants received in their resource pack examples of materials related to biodiversity issues (MOD3). The influence of the orientation texts is also evident in the topics/issues chosen by the participants for their assignments. For example, in Assignment 3 participants were requested to identify a plant or animal which was rare or endangered in their contexts (MOD3), consequently participants identified species such as the blue crane, elephant, chambo, cheetah, Eastern Cape rocky fish and cycads (AM1). Similarly in Assignment 1 participants were asked to conduct an environmental audit in a local context (MOD1). Many participants conducted environmental audits in their work or home context and some examples include audits of a local stream, a lake and a river (AM1).

- **Use of the assignment guidelines**

Guidelines were included in the orientation texts as a way of helping participants to approach their assignments and implement the materials in their work context with different learner groups (MOD1; MOD3). Thus, all the course participants used these guidelines to interpret and undertake their assignment work (AM1). The guidelines were used in different ways with some participants using them to provide some focus (FGP1; FGP3) while others used them to help in the development of the assignments (FGP2; FGP3). Although they were considered useful, some participants felt that the instructions were repetitive and confusing in places, particularly in relation to the assignment presentation and reporting (FGP1; FGP2) and assumed that all course participants had a work context (FGP3). The fact that English is the second language of many course participants was presented as a possible reason for this confusion (FGP1). The course tutors indicated that this issue led to some misinterpretation of the assignment tasks and that they were trying to simplify the guidelines (FGT).

- **Course activities prior to the assignment**

The course tutors agreed that the assignments are intended to guide the practical implementation of something discussed in the course sessions and that "… the links [between the on-course activities and the assignments] are very strong" (FGT). Examples of these links include an ecology study where the practical activities undertaken during on-course activities helped with the assignments (FGP2) as well as the activity on the HIPPO (Habitat loss; Introduced species; Pollution; Population; and Over-consumption) dilemma which helped with the implementation of the Assignment 3 (FGP3). Often before the assignments participants "… do some practical work [which] really helps a lot [it] just opens our minds …" (FGP2). Another on-course activity which helped with the assignment work was interviews done with community members (FGP2) as many participants interviewed people to obtain information for their assignments (AM1).

- **Usefulness of the resource pack**

The course developers designed the resource packs to provide a variety of materials which would help participants to develop their own materials (FGD). The resource packs are linked to each module and were developed as hands-on materials to support the assignment work (FGD). One of the resource packs was aimed at helping participants to "… plan and conduct an environmental audit with a group of learners" (MOD1) while the other resource pack was developed to help participants with a sample of ideas for materials development and to understand biodiversity change (MOD3). This seems to be consistent with the participants' perspectives on the usefulness of the resource packs which also encouraged the use of other learning support materials (FGP1; FGP3), provided background information and attempted to support a range of possibilities (FGP1; FGP2; FGP3). For example, for Assignment 3 the resource pack "… provided a focus on biodiversity issues and gave good ideas" for the development of materials (FGP3). Another participant noted that the resource pack is a useful starting point and without the pack he "… would be thinking widely" (FGP3), implying that the guidelines supported him to focus his work.

- **The most valuable experience**

Most of the participants interviewed agreed that the most valuable experience was conducting research (FGP1; FGP2; FGP3) and because one can "… learn a lot from the research as well, rather than the resource material as such" (FGP1). Apart from this, participants most valued the fact that they were able to develop their own materials which assisted them also to take action in their context using these materials (FGP1; FGP3).

Participants also recognised that the assignments provided many new ideas and new information on environmental issues (FGP2; FGP3). One participant who conducted an environmental audit of a local stream better understood her local environment and she "… became more aware of what was affecting the Eastern Cape rocky" (FGP3). Another mentioned that she has learned not only about blue cranes but also about other things she was not aware of (FGP1).

- **Comments on the learning process**

At the end of the focus group interviews participants were requested to reflect on the learning process that occurred during the designing and implementation of the resource-based assignment. The issues mentioned by the participants in the different groups were very similar and included the value of doing research as well as the importance of working with and involving others in the implementation of their assignments (FGP1; FGP2; FGP3). A participant noted that one learns more when researching something especially "… from those [the learners] you are researching with" (FGP1). Thus, it is important to "… let them [the learners] do the interviews, they are the ones who will hear the problems from the local people and they are the ones who came up with the possible solution poster … and the people understand much better from their neighbours, from their friends" (FGP1). Another participant said that she always draws on her learners because they give ideas for activities and they are interested in her assignments (FGP2).

Another issue highlighted by the participants was the usefulness of discussing the assignments with course and work colleagues before they start (FGP2; FGP3). This is illustrated by a participant, who had many issues to deal with in her school context and thus she sought advice from colleagues on how to identify the most important issue for her assignment (FGP2).

Another important aspect of the learning process seems to be the range of skills that participants have developed during the assignment work (FGP1; FGP2; FGP3). These skills included the ability to develop materials and questionnaires, communication skills, research skills as well as reporting skills (AM1). A participant said for example that "… the skill of developing a questionnaire was quite an achievement" (FGP3) while others mentioned that the assignments enable them to have contact with different people and to be able to express themselves clearly (FGP2).

Some participants pointed out that the assignment work was important in providing new ideas and information on environmental issues (FGP2; FGP3), the resources provided help to understand new concepts (FGP1) and participants were able to recognise that people have different views (FGP1; FGP2; FGP3).

4.2.2. Diagrammatic representation of resource-based learning

Below is an initial diagrammatic representation (Figure 4.1.) of the resource-based learning processes apparent in the ACEE. This initial representation noted five phases that emerged from the data generated from the focus group interviews with course participants, tutor and developers as well as from the course documents (e.g. two course modules).

The diagrammatic representation of resource-based learning illustrates the processes in which participants were engaged while preparing, designing, implementing and reporting their activities in assignments. It starts with the identification of an environmental issue or species (1) followed by a researching activity (2) which consists on the exploration of participants' local context, interviewing people and accessing materials and information. Participants later develop their own materials or adapt existing materials (3) and they use these while making decisions about how to use them effectively (4). The last step involves the narration of their practice (5) through some form of reporting (written or verbal).

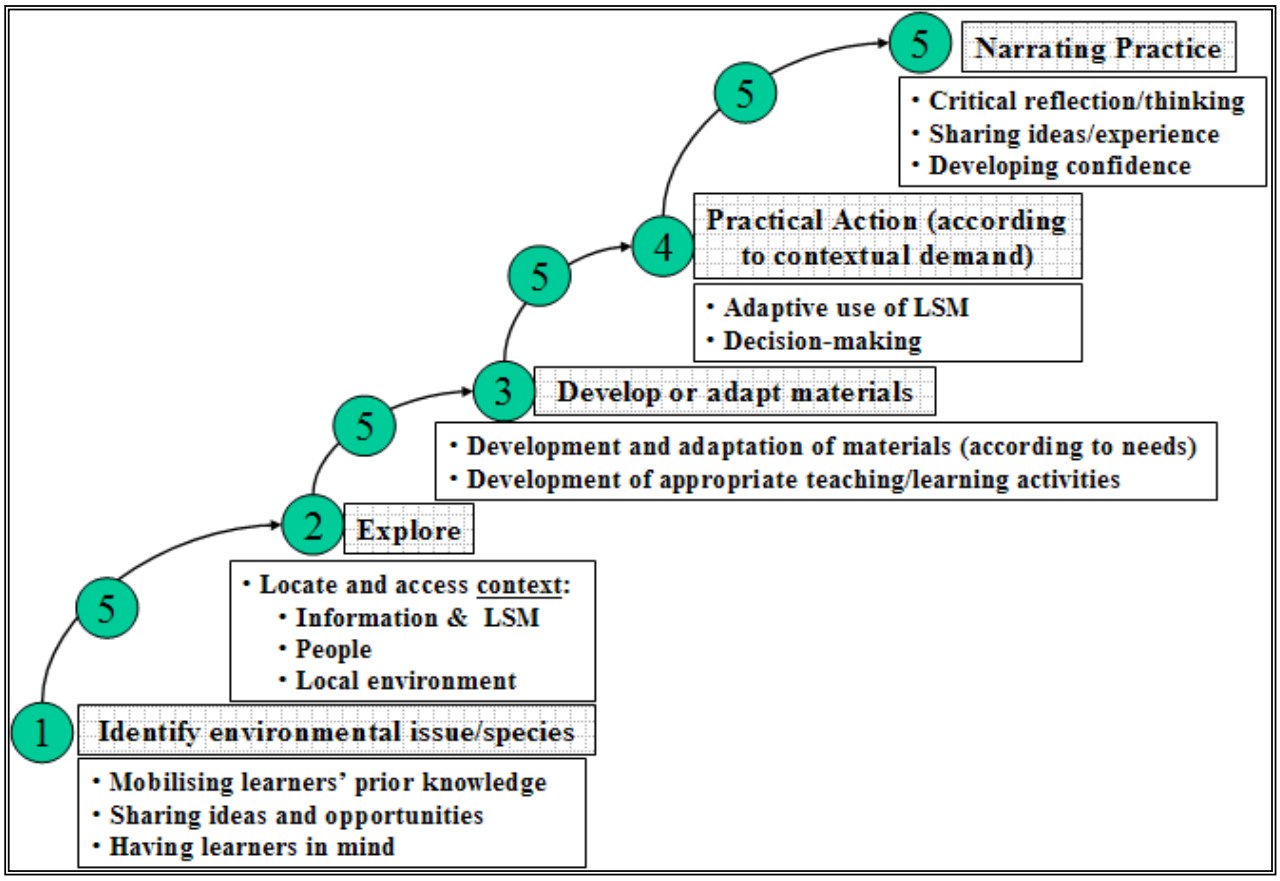

Figure 4.1. Initial diagrammatic representation of resource-based learning

For a better understanding of the above diagrammatic representation of resource-based learning processes (within the assignment work undertaken by the course participants) apparent in the Advanced Certificate in Environmental Education, an explanation of this representation is provided below.

- **Phase 1 – Identify environmental issue/species**

To undertake the assignments participants were required to identify **environmental issues** by conducting an environmental audit (for Assignment 1, MOD1) and to develop an educational pack on biodiversity issues focusing on an **endangered species** (for Assignment 3, MOD3). In the first phase, participants used prior knowledge and experience in the identification of issue/species. For example, a participant chose Lake Malombe (for the environmental audit) and chambo (an endangered fish species in Lake Malombe, for the educational pack) because he was very familiar and knew a lot about the lake and its fish types (FGP3).

Within this phase it was also evident that participants shared ideas and discussed opportunities with their course and work colleagues on possible environmental issues and endangered species for undertaking the assignments. A participant who teaches in Grahamstown sought advice from the course colleagues (FGP2) while another working in the National Zoo in Pretoria discussed his ideas with work colleagues (FGP2). Another way of sharing ideas for the assignment was the discussion participants had with other people working in specific fields such as a scientist working with the Eastern Cape rocky fish (FGP3).

Another aspect is evident in the first phase of the assignment work is that participants were concerned with whom they would use the materials they were going to develop. Having a particular participant group in minds seems to have helped in the way participants undertook their assignments and developed or adapted materials. For example, a participant developed picture-based materials to address issues of illiteracy and used posters to "… try to reinforce some of the words like endangered, extinct …" (FGP3). Another participant considered the accessibility by choosing environmental issues and species which the learner group had easy access (FGP2).

- **Phase 2 – Explore**

A second phase appears to be related to using different ways of exploring the environmental issues and endangered species identified by the participants. The process of using these different exploratory ways involved in firstly locating and accessing the sources of information relevant for their assignment focus/issue and secondly guaranteeing access to the places where learners could be exposed to the issues and species identified. When exploring and researching environmental issues and endangered species participants drew extensively on written information and available learning support materials, interviewed people and visited their local environments (FGP1; FGP2; FGP3).

To access and use written information, participants visited a number of institutions (e.g. museums and environmental organisations) and drew on materials available in their work context as it was a useful way of getting more ideas and information (FGP1; FGP3). A participant mentioned that she "… developed the crane saving game from [the Umgeni Water] water saving game" because the information from the pack was too limited (FGP1). Another participant developed a biodiversity pack on cheetahs drawing on an environmental fact sheet from Namibia as a source of information (FGP2).

Another significant characteristic of the second phase was the importance that participants placed on interviewing people to explore different environmental issues and endangered species. Examples of this are interviews conducted with staff from the KZN Nature and the Crane Foundation (FGP1), people from the Albany Museum and Tourism Board (FGP2) and people working in a particular field (e.g. Eastern Cape rocky fish) (FGP3). Course participants also interviewed local people and community members to obtain more information about the issues they were investigating (FGP1; FGP2; FGP3).

The last activity in this phase was the site visits that participants did to deepen understanding of the context of the issues and species they were investigating and to see whether they could take their learners for field visits. This activity helped participants to decide on the issue/species they would work with (FGP1; FGP2).

- **Phase 3 – Develop or adapt materials**

The third phase represented on the Figure 4.1. illustrates aspects related to the development and adaptation of materials as well as the development of appropriate teaching and learning activities in which these materials would be used. As explained above (see Section 4.2.1) participants developed and adapted a wide variety of materials. The process of development of such materials varied according to the learner group and influenced the type of teaching and learning activities planned. Simpler materials (e.g. posters, cards and games) were developed for younger learners while more complex materials (e.g. fact sheets) where developed for adult learners.

For the development and adaptation of materials, participants drew on the resource packs and on information obtained from the research that they conducted. Some participants used the frameworks provided (e.g. HIPPO dilemma) to come up with different materials "… meaning that one can use the resource materials in different ways, one can adopt and one can develop other materials drawing on ideas from others" (FGP1). Other participants developed worksheets to be used in field activities and planned these activities to be supported by the materials they developed (FGP2; FGP3). It is evident that most of the materials were developed to be used in teaching and learning interactions in different contexts (FGP1; FGP2; FGP3).

- **Phase 4 – Practical actions**

This phase builds on the other three phases, particularly the last one which emphasises that materials were developed with a pedagogical intent. Materials were developed to be adaptively used according to contextual demand and participants had to make appropriate decisions in this regard. Contextual demand refers to understanding the context in which the materials will be used and the issues they will be addressing, thus stressing the importance of deciding when and how the materials should be used. This seems to be consistent with the requirements of Assignment 3, where participants are required to provide evidence which illustrates how the learner group (or the educator) engaged with the learning support materials and activities in context (MOD3).

Some of the examples of materials being used in local contexts with a pedagogical intent (learning support materials) included a poster on South African biodiversity to find out what learners already knew about biodiversity (FGP3), a poster on blue cranes to raise awareness of local people (FGP1) and other materials to introduce learners to the Eastern Cape rocky fish (FGP2). As with the assignment on conducting an environmental audit, all the materials produced (e.g. worksheets, questionnaires and audit sheets) were used in local field-based activities to collect information and plan some sort of action (FGP1; FGP2; FGP3).

- **Phase 5 – Narrating practice**

The narration of practice takes place throughout the process of describing and reporting all the phases that participants were involved in during the assignment work. In this phase participants seem to be expected to be able to critically reflect on the whole design and implementation process, and share ideas and new experiences with colleagues as well as develop self-confidence. For example, participants were required to define a clear purpose for the audit as well as to provide a description of the learners they worked with (MOD1). They also provided some evidence of having found good quality information on a relevant issue as well as an account of the relevance of the selected learning support materials to the local context and learner group (MOD3).

One of the participants mentioned that after the completion of the assignment (by documenting what he had done, how and why) he felt more confident with what he had done and he felt that it would be easier to do this assignment again (FGP1). Some of the new ideas and experiences that participants shared in their narratives relate to insights that in the school yards or around the schools there are wetlands and rivers that can be used

as good resources for learning and the fact that a river or a zoo can also be used as resources to support learning (FGP2).

4.3. Individual case stories

As explained earlier (see Section 3.3) three case stories were constructed with the interview data, participants' assignments and ratified by the ACEE course participants. This process provided further insights into the resource-based learning processes apparent in the Advanced Certificate in Environmental Education. The stories allowed me to probe the cases in detail and to ratify resource-based learning processes as these played out in a number of different contexts. The three stories are presented below and each is divided into three sections, namely an account of Assignment 1 and Assignment 3, and overall comments on the assignment work.

All of the data used to construct these stories is focused on the assignment work. This is used to provide insights into ways in which participants engaged in the adaptive use of learning support materials in their work context (see Section 4.4). It also sheds light on features of course design and course implementation in the Advanced Certificate in Environmental Education (see Section 4.5).

4.3.1. Case story 1 – Joan

The first case story presents Joan's experience on the course. She works as an environmental freelancer in Grahamstown. She has a scientific background in coastal processes, beaches and dune ecology and a particular interest in developing learning support materials. Joan was chosen because she, as an environmental consultant, represents the private sector and in her assignments she has worked with a diversity of learner groups. She also established strong links between Assignment 1 and Assignment 3

In constructing this case story I used the following data sources: Focus group interview (02/10/2002, FGP3); Semi-structured interview (28/10/2002, INT1); Assignment 1 (April 2002, ASS.J1); and Assignment 3 (July 2002, ASS.J2).

4.3.1.1. Assignment One

When developing her assignment she had to decide on what was going to be audited and with whom was she going to do the audit. She discussed some ideas with the course tutors and decided to conduct an audit of people's attitudes and perspectives of a local stream (one of the tributaries of the Bloukrans river) in her

neighbourhood (Hillsview). “We did some discussion on the course …” (INT1). She chose that topic because she was concerned about the management of the stream and wanted to find out whether other people were also concerned. The fact that the stream runs through her property influenced the decision of doing the audit particularly because she has seen how all the litter and alien vegetation affects her property. “… I have seen all the litter coming down there … the alien vegetation … I had to pay for people to come and cut [it] down …” (INT1). The purpose of the audit “… was to determine the attitude and knowledge of the participants [her neighbours] to the stream, and to identify areas of environmental concern” (ASS.J1:3).

The next thing she did was to read about audits and other materials provided in the resource pack. “I did as much reading as I could before I started doing that [audit]” (FGP3). She took photos of the stream and walked there to look at things that people might want to describe. She did some research on the Water Act and other legislation about dumping in Grahamstown. Joan “… went to the Municipal bylaws for instance to find out information about dumping, and to find out if there was anything about cementing the stream …” (INT1). She also looked for information on alien vegetation and on that particular river stream. Joan “… walked the stream quite a bit … to look at things that people could or might want to describe” (INT1). Based on the information collected and drawing on the examples provided in the resource pack she developed a questionnaire. In doing this she thought about things that she wanted to find out by considering what needed to be in or to be left out. She did not want the audit sheet to be more than an A4 sheet, so she developed a double-sided A4 sheet with a view “… to try to capture the main environmental issues associated with the stream” (ASS.J1:5). She also shared it with the course tutors and based on that some things were modified. “It was useful to have these learning support materials because I have never done an audit before, I wouldn’t have known really where to start …” (FGP3).

After having the questionnaire ready, instead of putting the questionnaires in the letter boxes, she went from door to door to distribute them. The main reason for that decision was the fact that she felt people will not respond to the questionnaires by themselves. She explained to people why she was doing that audit and most people were happy to respond to the questionnaires and keen to get feedback. She distributed the 28 questionnaires and received 24 back after three weeks, most of which were personally collected by Joan.

She analysed the questionnaires by summarising the information in a spreadsheet and later produced a summary table of the information so people could easily see the results. When she was writing the report she considered how she would provide feedback to people. Initially she thought of having a two page report but actually she ended up with an eight page report which identified the environmental issues perceived by the participants. Apart from the formal report she also gave people a Z-fold information and identification sheet about alien species specific to the local stream context and the Share-Net fact sheet on waste management.

She has been following up on this audit with the audit participants and a meeting was organised to mobilise people to address some of the issues (both individual and collective issues). Some people suggested that Joan should write an article and share the concern with a wider public. In terms of action she thought that if there are enough people interested a river care group could be formed and the information collected through doing this assignment was going to be used in the development of a community problem-solving programme.

Through the auditing she got to know the neighbourhood, got different insights from people that had just moved in *versus* people living there for decades. She also learned about invasive species and suggested that the questionnaire was a form of mobilising prior knowledge and putting existing information together (rather than conducting an investigation). "… I learnt a lot through doing the audit, first of all I got to know my neighbourhood a lot better ..." (INT1).

4.3.1.2. Assignment Three

For assignment three Joan focused on a freshwater fish, the Eastern Cape rocky fish (*Sandelia bainsii*) and worked with an environmental club from a local school – Makana Primary School (mostly grade 7 learners) and through the education department at the Albany Museum and with an Albany Museum scientist. She has chosen the Eastern Cape rocky fish because it is an endangered species from Eastern Cape, which is also listed on the IUCN (The World Conservation Union) Red List (ASS.J2) and could be found in her local context. She noted that it was relevant to the previous assignment (environmental audit of a local stream) and "… a very appropriate species for learners in the Grahamstown area to investigate" (ASS.J2:1). The purpose of developing an educational pack was to support the exploration and ways of responding to the extinction of the Eastern Cape rocky fish.

She started by collecting information on the fish by interviewing the Albany Museum scientist (who is a champion of the Eastern Cape rocky fish). He showed her slides and gave her relevant background information including web addresses, posters, information booklets and other existent materials and literature. She also used a map of Grahamstown and of the rivers in the Eastern Cape. The Albany Museum was used as a resource centre and some of her activities took place there where she involved education officers from the Albany Museum. She also drew on the experience of an outing with the branch of the Wildlife and Environment Society of South Africa to the Blaauwkrantz Nature Reserve earlier in the year.

From the pack, Joan used the poster to find out what the learners knew about South African biodiversity, and she drew on the wild dogs cards idea to develop her own worksheet for the HIPPO dilemma. For Joan, the pack "… provided a focus on biodiversity issues and gave good ideas … [and she] … used quite a few

elements from the pack" (FGP3). "I have photocopied the HIPPO dilemma from my pack … and made it applicable to the Eastern Cape rocky …" (INT1). She also drew on existing information on the Eastern Cape rocky (e.g. environmental fact sheets, websites and an article from a recent museum magazine) to develop her own fact sheet with specific headings and questions. "… I did find that [in] this fact sheet the facts were a bit jumbled and it's not very readable so that's why produced my own fact sheet …" (INT1). She also recognised that in using the resource pack she had to adapt materials to suit her needs and the needs of the learner groups she worked with. When designing the activities for the materials she developed Joan took into account that "… this particular group of learners does not have access to computer facilities" (ASS.J2:4). She also found the materials provided in the biodiversity pack to provide very useful information.

The fact sheet was a component of a more contextually relevant biodiversity pack of materials to the Eastern Cape that Joan developed and which was used with the learners in different sessions. This pack of materials included an environmental fact sheet, information resource pack, worksheets, posters and a set of activities for learners. In the implementation of her pack there were problems with second language speakers. Some learners struggled to understand some concepts and she felt that a presence of a Xhosa speaking person would have helped. To address this she "… had a couple of posters up which were there to try to reinforce some of the words like endangered, extinct …" (FGP3). Because of time constraints she could not finish some activities in class and therefore learners were encouraged to finish them at home. This caused some problems of interpretation that she promptly tried to address by providing an example-sheet and by drawing on staff from "… the Museum to talk about the concepts in Xhosa" (ASS.J2:7). In one of the activities she split the learners into groups and each group was encouraged to share different information from the fact sheet.

After each session with the learners Joan discussed it and reflected on it with educators and scientist from the Albany Museum. The focus was on how the activities had gone. After the classroom sessions she organised for the learners to go to the stream for an encounter activity. Although a litter clean up was done she noted that the action component of her assignment was lacking in activities like an alien species hack. She also noted that her activities were developed to suit the group she was working with, and she also suggested that she would do it differently if the learner group was different. "With a different group it might be completely different …. If I took [learners of] the same age from a private school in Grahamstown I would have had to design the activity differently … I have kind of designed it for the user group that I had …" (INT1). She felt that the action side of the assignment needed some more attention and time. "… the one thing that I thought that was lacking was that there wasn't enough of an action thing …" (INT1).

4.3.1.3. Overall Comments

Both assignments gave her the skills to be able to develop learning support materials like worksheets and environmental fact sheets, and the ability "… to develop another type of resource …" was a valuable experience (FGP3). For assignment three she emphasised that the guidelines were useful and necessary for focusing the assignment and the HIPPO dilemma helped her to understand the context and reinforced some of the ideas that she had for the assignment. Joan considered the pack as a very useful resource because it provided a focus on biodiversity issues and good ideas.

For Joan what was valuable was to get in touch with local issues and understanding her own environment. She enjoyed working with the learners (especially because she does not have a teaching background). It was also good to work with staff from the Albany Museum and through interactions with the staff she learnt a lot as "… we interacted and reflected on how it [the activities] had gone …" (INT1). Another valuable experience was the opportunity of developing other types of materials.

For Joan the learning process was good and it was useful to have the learning support materials otherwise she would not know where to start, so in this respect the guidelines were also fine. One of the difficulties that she had with the course is the assumption that one always has a workplace and people to work with, but in the case of assignment one she used her home context and it worked very well. Some of the skills that she developed with these assignments were related to the development of learning support materials. With the audit, in a way it enabled Joan to take some action and she sees these assignments as ways of starting to do something for the environment and strengthening her own action competence. The fact that she is in Grahamstown is an advantage because she can clarify queries at the Rhodes University Department of Education, so tutor support is "… quite an important component for me, it helps along the way … it is not just getting the support pack and the guidelines … there is additional support available" (FGP3).

4.3.2. Case story 2 – Abel

The second case story presents Abel's experience in the course. He works for the National Zoo in Pretoria as an education officer. He uses the information available in the Zoo to teach the school learners who visit the Zoo about animals, plants and about environmental issues. I chose Abel because of his diverse activities in his work context and the wide range of learner groups he works with. The fact that he represents the public/government sector has also influenced this choice.

In constructing this case story I used the following data sources: Focus group interview (01/10/2002, FGP2); Semi-structured interview (11/11/2002, INT2); Assignment 1 (April 2002, ASS.A1); and Assignment 3 (July 2002, ASS.A2).

4.3.2.1. Assignment One

The first thing that Abel did for his assignment one was to identify the best opportunities for him to conduct an environmental audit. He looked at the materials that were given in the pack and first thought of doing a general audit of the Zoo in terms of electricity and water. Later he realised that a general audit would not be easy for the children to do and obtain meaningful information. Therefore he tried something that school children could do and have some practical experience and for these reasons he decided to focus on a hands-on activity, a river audit. He worked with school children from Grade 10 from Holy Trinity High School in Attredgeville as the audit "… was compiled to cater for the level of learners who carried it out" (ASS.A1:1). The river was chosen because "… it was simple for children to go to the river because there are no boundaries …" and because it is polluted it seemed the ideal situation to use for educational purposes (INT2). Another reason was the fact that the Apies river flows through the Pretoria Zoo. Using the whole zoo was not appropriate because there are animals and children are not allowed into the enclosures to investigate issues.

Drawing on the resource pack he compiled a "… worksheet by going to the river, looking at everything that was there, looking at the surroundings on the river and then writing the whole worksheet" (INT2). "The planning was made by the river side, so as to be able to identify the down flows of the river" (ASS.A1:3). In developing the worksheet he drew on some of the questions from the questions in the pack. "I looked at how they designed the questions then I was able to make my own questions and worksheets" (FGP2). Other questions he developed by doing a visit to the river. For example when he saw dead animals he put a question on that and if he saw an alien plant he would also put a question on alien plants so they could find it, and did the same for other things such as houses, school and roads. He looked at things that were there and he also put some things that were not in the surroundings so students could think about what they can and cannot see, instead of just ticking everything. "The questions were structured in such way that the learners had to view the river and give an honest opinion of what they see and express their views on the situation …" (ASS.A1:3). He also used a CD Rom (from UNESCO) that had some information about precious water to develop materials to discuss with the learners. In the UNESCO CD he found "… something about precious water which I gave them [the learners] to read through it and we discussed later" (INT2).

After that he organised an activity with the students from Holy Trinity High School. They started in the Hall where Abel explained to them what an environmental audit was and why one should do audits and discussed

these topics with them. After the discussions he gave the worksheets to the learners and went to the river to do the audit. After completing the activity they discussed how they found the audit exercise. It was interesting to them as usually they do not go out of the classroom when they do activities. When they finished the audit he used all the worksheets (one by one) to put together the end result, e.g. what they found out about the river. He realised that some of them were just ticking while others really did the audit by looking around. The results were not reported back to the students but were included as part of the assignment.

4.3.2.2. Assignment Three

When doing assignment three Abel looked at the resource pack given during the course and drew a lot on it do develop his own questions. “I looked at the pack that they gave us, most of the questions [I developed] I draw them from the pack …” (INT2). But he did not do exactly as in the pack because in it things were separated, the HIPPO dilemma and the activities were separated. He just put together as one thing and gave copies to the children so they could have time to read. In this assignment he focused on cheetahs (*Acinonyx jubatus*). The reason why he chose the cheetah was because it was the only endangered animal (“Cheetah has a critically endangered status”, ASS.A2:1) in the zoo (his workplace) that was safe to use with the learners and it was related to the context of his work. “The cheetah was the only animal I could take action with the learners, so they can go inside the enclosure of the cheetah … while the other endangered animals … are more dangerous than the cheetah” (FGP2). It was also easy to take learners to places where they could see these species. Firstly he had to discuss that possibility with the conservators who have agreed that he could use the cheetahs for his assignment and secondly he got permission from the zoo officer.

He mentioned that when developing the questions for this assignment, he had to trial the questions first, because some of them did not work very well. So he had to develop another worksheet and tried to develop questions were people would elaborate the answers, because the participants had to do interviews. “Putting the questions together it was tough, I remember the one for cheetah I had to put questions first and then give them to [learners so they could] go and do it … some were not working very well … people were just answering yes or no” (INT2). So by doing activities (using the questions) they were able to improve the questions.

The resource pack was very important because it helped to do different things, especially because the questions and examples enabled him to do something different. For example, he adapted the HIPPO dilemma to the cheetah species which was going “… to be used to investigate why the cheetahs are racing to extinction” (ASS.A2:3). From the wild dogs cards he developed a game called ‘cheetah and ladder’ to help children “… to understand what problems the endangered species of cheetah experience” (ASS.A2:5), and

also developed worksheets for the learners "… to find out [information about the cheetah] from the conservators at the Zoo" (ASS.A2:5). He used a Namibian fact sheet on cheetahs because it was more relevant to his work and gave him background information on cheetahs.

All the materials developed were used with four Zoo club members. They received the materials and had to prepare for the activity. "Learners were given notes to prepare themselves for the next day. They had to read about the animal [cheetah] and find more information from other sources" (ASS.A2:6). Abel worked with the learners by using the HIPPO dilemma, where learners had to go out an interview people about the cheetahs (why is it an endangered specie, how to protect it, what do people know about the cheetah). "Learners were given the opportunity to interview four visitors each" (ASS.A2:7). It was very interesting to find out that people have different views. "It is interesting what you hear from people" (FGP2) as the learners have "… different views on rivers, ideas on water conservation, water preservation and many other matters pertaining to water problems" (ASS.A1:4).

4.3.2.3. Overall comments

Abel felt that these assignments helped him to improve his work by enabling him to know different things which he had not realised before. He learnt about outcomes-based education, for example, and now is changing his programmes accordingly. He learnt that Namibia is the country with the highest numbers of cheetahs in the whole world and learnt that a river or a zoo can be used as resources for learning. He also developed some of the skills which included organising (organising his work, writing assignments and presentations or reporting back), researching, taking action, communication skills (to contact different people and being able to express himself more clearly), different teaching approaches and the development of more confidence in his work.

Abel felt that the guidelines provide important background information but are sometimes difficult to follow. The reason why they are sometimes difficult is due to the fact that it is not always possible to follow the instructions step-by-step. He further noted that the practical activities done in the course (e.g. ecology study) helped him to understand the assignment better because such activities were relevant to the study he was undertaking.

4.3.3. Case story 3 – Zola

The third case story presents Zola's experience in the course. She is from KwaZulu-Natal. She works as an assistant to the Gold Fields Environmental Education Service Centre. She is involved in field work activities and gives support to teacher workshops and school-based projects. I chose Zola because of her involvement

in the non-formal education sector as well as her involvement in a number of school-based initiatives. The fact that she worked with quite a diverse group of learners also influenced this choice.

In constructing this case story I used the following data sources: Focus group interview (01/10/2002, FGP2); Semi-structured interview (11/02/2003, INT3); Assignment 1 (April 2002, ASS.Z1); and Assignment 3 (July 2002, ASS.Z2).

4.3.3.1. Assignment One

Zola did not attend the first session so she received the materials for the first assignment by post. She then went through the resource-pack and started the assignment. She had "… to learn a lot of thinks before [she] could even start working on the assignment" (FGP2). She decided to work with a nearby school (Mpophomeni High School) because of Zola's familiarity with it. She lives in the community where the school is situated. "I wanted to know what was happening in my area … where I am living …" (INT3). She visited the school and spoke to the principal who referred her to a teacher who was working with an environmental club. On the first day the teacher gave the history of the school environmental club and how they were trying to improve things by working on issues such as energy use and water. "She showed me around the school and I got a chance to see the school and its surroundings … there were no trees, there was a problem with waste management as was evident from the litter all over the grounds" (ASS.Z1:2).

From the pack she first used the introduction to the environmental audit and from there she looked for information on how to do an audit. This she did by drawing on different environmental examples from the resource-pack provided on the course. Due to lack of time she concentrated on items in the pack that would help her to do the assignment. She used the example questions for environmental auditing and was able to draw up her own questions in relation to a situation in a school she was working with. "From the example questions I was able to draw some questions related to the situation in the school" (INT3). For that she first visited the school and also drew on other people's experiences (e.g. work colleagues and teachers). "All that I have seen in the school has given me the idea to conduct an environmental audit on resource use and waste management …" (ASS.Z1:2). In adapting the materials from the pack she had to change the language (isiZulu) to suit the context of the school she worked with. "I also had to think about the situation in the school to make it [the material] contextual to the learners" (INT3).

There were some questions from the resource pack that were used and these questions were adapted so they could make sense to the learners (for example maybe only two or three learners had electricity at home) and

also questions that were relevant to the situation in the school. “When doing an audit, it is important I ask them [learners] questions they would be able to understand …” (ASS.Z1:3).

She decided on the issues based on the area where the school was situated (Mpophomeni) and these were related to water, energy and plastic/paper, and some of these were associated with littering in the community. “I have chosen to conduct an audit of resource use and waste management at a local school” (ASS.Z1:1). Learners’ participation in the audit was good because they had a background on environmental issues (environmental club) and they did enjoy doing the activity and it was easy for her to work with them. Some of the findings were related to the amount of water and electricity being wasted on a daily basis. Skills developed by Zola included learning about techniques in the use of environmental audits.

Zola felt that the guidelines were very useful in guiding the implementation of the assignment, especially the examples, because they gave an idea of what type of materials can be used. She noted that the resource pack “… gives you guidelines it just gives you ideas on how to go about …” developing other materials (FGP2). She struggled because she was not in the first session and to overcome that she said that the pack helped her to start. Zola added that the materials really helped because without them it would not have been possible to do the assignment. She finds the pack useful because it gives her a number of alternatives to choose from.

4.3.3.2. Assignment Three

For assignment three Zola decided to focus on cycads (*Encephalartos natalensis*) because it is an endangered species and it was easily accessible in her place of work (Umgeni Valley Project). Zola has chosen cycads because at Umgeni Valley (her workplace) there is a cycad camp with a number of cycads which she could visit with the learners. The other two factors that influenced her decision were the fact that she was interested in cycads and because it was easy to find information on cycads.

She based her materials on the resource pack provided (*Windows on the Wild* pack with lots of guidelines, ‘introduction to biodiversity’ material and on the ‘HIPPO’ dilemma concept) to develop her own material. Thus, to develop her materials she “… first used the introduction to biodiversity … and then the environmental fact sheet …” (INT3). She has not produced a pack as required because she thinks she misunderstood the instructions in the assignment task. Based on the resource-pack and other existing materials (at Umgeni Valley and also a Share-Net fact sheet on cycads) she developed her own materials (environmental fact sheet). “With the help of the enviro facts I have developed my own …” (INT3). She then used it with the learners “… for reading more information and open discussions” (ASS.Z2). She also contacted different people working with cycads in South Africa. “I contacted different persons from the Endangered Species Protection

Unit …" (INT3). She contacted these people so as to make the materials more contextually relevant and to enable the learners to make more sense of the, (it included more photos and locally relevant information).

Zola worked with a group of learners from neighbouring schools. She took them to Umgeni Valley to look at the cycads and she explained the reason for the fieldtrip. She was also looking, with the learners, at the relationship between the written information and the cycads in their natural environment. The use of the fact sheet with learners consisted of a field trip to Umgeni Valley where learners had to find the cycads and check the accuracy of the information. They also had to draw the leaves, the structure and the plant itself, and compare the cycad with other plants (so as to look at the differences). The learners also had a follow up discussion on the above issues. "When having discussions the learners learnt to express themselves and to think critically" (ASS.Z2, emphasis on original).

This activity was very important for Zola in terms of her developing skills but also in terms of learning about lots of things related to cycads that she did not know before. She learned more by doing, but she realised that she could have done better if she had understood the task better. Also some of the information she needed came late (two weeks before the assignment was due).

4.3.3.3. Overall comments

Zola also noted that Assignment 3 was a very interesting activity, particularly in terms of finding out more about cycads and getting to know the different opinions on this issue, as well as the current problems of people stealing cycads. "I didn't have enough information on the cycads, I didn't know that there were people interested in keeping the cycads, there were laws against keeping cycads at home" (FGP2). Zola learnt that cycads are very old plants and that people use them for traditional purposes.

The process of discussing the assignment brief with other colleagues, presenting the topic to get comments from colleagues and previous sessions was very helpful. "Sometimes before they give us the assignments we do some practical work, it really helps a lot, just opens our minds" (FGP2). This exercise made her realise that in the school yards or around the schools there are wetlands and rivers that are not used but that are good resources for learning. The schools "… have got wetlands, they have got rivers and they have never used them, like as part of experiential learning with the learners" (FGP2).

The case stories above and the diagrammatic representation of resource-based learning approach in the ACEE (see Section 4.2.2) were influential in the development the thematic categories for resource-based learning (see Sections 4.4 and 4.5 below). The two sections below will draw on the case stories, the

diagrammatic representation (see Figure 4.1) as well as other data sources to present an analysis of issues pertaining to participants' experience of assignment work, and course design and course implementation. It should be noted that the two sections below draw extensively on the rich description of the three case stories as they were analysed and followed up in more detail. However, these stories cannot be considered in isolation from the evidence-based data generated in this research. Thus, examples from other ACEE course participants are also used to illustrate certain points in this research and to provide a wider picture of the case.

4.4. Analysis of participants' experience of assignment work

The compilation and review of the three case stories presented above enabled the development of four thematic categories related to the participants' experience of assignment work (see Section 3.5.2). These four thematic categories include:

- Focus on context (4.4.1);
- Adaptive use of learning support materials (4.4.2);
- Narration of practice (4.4.3); and
- Assignment support (4.4.4).

Below I present the main issues of each thematic category that emerged in the focus group interviews with the course participants, tutors and developers and semi-structured interviews with the participants (see Appendix 6) as well as in the participants' assignments and course modules (see Appendix 7).

4.4.1. Focus on context

During the process of undertaking the two assignments participants seem to have placed a strong emphasis on **context and local environmental issues**. The assignment work included conducting research in context, the development and adaptation of materials, the use of materials in teaching and learning activities, fieldwork in a local context, and reporting the assignment work through written and verbal reports. This was guided by the orientations provided in the course modules as they specifically requested participants to "… conduct an environmental audit to identify environmental issues in a **local context** [my emphasis] …" of their choice (MOD1:1) and to "… develop an educational pack for supporting learners in exploring and responding to **local biodiversity issues** [my emphasis]" (MOD3:1) (see Appendix 5).

The focus on context included assignment work based on the **identification of a specific topic** (with an emphasis on local environmental issues or endangered species) and on the identification of a learner group

(AM2; AM3). This is evident in all the assignments where participants looked at local issues/species and worked with local learner groups (AM2; AM3). For example, a participant from the Free State focused on the elephant as an endangered species in that province as his topic for Assignment 3 (FGP1). In Assignment 1, Zola worked with members of an environmental club from a local school to conduct an environmental audit of resource use and waste management (ASS.Z1) while Abel conducted an environmental audit of the river in his workplace and involved learners from a nearby school (INT2).

The focus on context also emphasised the need for participants to conduct **research** when undertaking the assignment work (AM2; AM3). In the two assignments, research included finding out information related to participants' assignments from other sources. These sources included people working on environmental issues or with endangered species, places where environmental problems were evident and publications on the issues/species identified by the participants for their assignments (AM2; AM3). In conducting research for their assignments, participants interviewed and talked to people (e.g. scientists, local community members, colleagues) (FGP1; FGP2; FGP3), obtained information from books, fact sheets and from the internet (FGP1; FGP2; FGP3), contacted relevant institutions (e.g. Umgeni Water, the Crane Foundation, Albany Museum) (FGP1; FGP2; FGP3), visited places (e.g. river stream, local school, zoo) (FGP1; FGP2; FGP3) and drew substantially on the materials provided in the resource packs (FGP1; FGP2; FGP3).

It seems that the focus on context and the emphasis on research have enabled the participants **to better understand** environmental issues in their home and work context and thus be able to develop more contextually relevant and appropriate materials. For Joan, focusing on context has enabled her to better understand her own environment (FGP3), while for Abel the emphasis on research has had a positive impact on his work enabling him to improve his educational programmes (INT2). This is supported by the course tutors who note that the notion of contextual learning is very important as it should enable the development of participants' skills on how to respond to local issues (FGT). The course developers also emphasised that one of the main objectives of the assignments is for participants to apply the ideas learned in the course in the context of their work (FGD).

4.4.2. Adaptive use of learning support materials[14]

The role of the **resource packs** in providing background information, guidelines, examples of materials and steering ideas for the development and adaptation of materials seems to be significant for the process of

[14] The process of adaptive use of learning support materials consists of learners drawing on a set of existing materials relevant to their work (those provided in the resource pack and those collected by the learners) to adapt or develop their own materials to suit local needs (e.g. appropriate language, contextual issues and needs of learners groups), and subsequently to use them in the context of their workplace with a group of learners with pedagogical intent.

'adaptive use of learning support materials' (AM2; AM3). Another significant aspect of the assignment work that participants' experience when undertaking their assignments is the need to engage in the adaptive use of learning support materials in their work context (AM2; AM3).

According to the tutors the participants draw on the resource packs (and their guidelines) to adapt and develop their own materials (FGT). This is manifested in all the assignments undertaken by the participants (AM2; AM3). An evidence of this, for example, is Abel's worksheet for his environmental audit. He drew on the resource pack by looking at how the questions were designed and then he was able to design his own questions and worksheets (FGP2). A similar approach was used by Zola who also drew on the example questions from the resource pack and "… was able to draw some questions related to the situation in the school" (INT3). The tutors further note that the materials most often used in the assignments were the auditing sheets for Assignment 1 and the HIPPO dilemma for Assignment 3 (FGT).

As explained earlier the process of adaptive use of learning support materials involves two main steps, firstly, the **development and/or adaptation** of materials and secondly, the **use of materials with learners in context**. It is evident that the majority of the participants developed new materials drawing on the resource packs and other materials they collected (AM2; AM3), and adapted materials to suit their work/home context and the needs of the learner groups they worked with (AM2; AM3).

As described above (see Section 4.4.1) course participants did not limit themselves to the materials in the resource packs but through research they were able to identify other sources of information and examples of materials to draw on for the **development/adaptation** of their materials. Zola used a combination of both information and examples for the development of her fact sheet on cycads (INT3), Joan drew on the resource pack and on the internet to develop her fact sheet on the Eastern Cape rocky (INT1), and Abel used the wild dogs cards from the resource pack and a Namibian fact sheet on cheetahs to develop a game called "cheetah and ladder" (INT2; ASS.A1). Some examples of participants adapting materials to suit local needs include adaptation of the HIPPO dilemma to the context of the Eastern Cape rocky (INT1) and cheetahs (ASS.A2). Zola felt the need to adapt materials from the pack when changing the language of the materials to suit the context of the school learners she worked with in her Assignment 1 (INT3).

The process of adaptive use of learning support materials involves the **use of materials** developed and/or adapted by the participants in the context of their workplace (AM2; AM3). The use of these materials takes place with a group of learners and has a pedagogical intent. As explained by many participants the identified learner group has a significant role in the way materials are developed and used. This is motivated by the language learners speak fluently (FGP3; INT3; ASSJ.2), the relevance to the learners of the issues debated

(INT1; ASS.Z1), the objective of the activities (INT1; INT2; ASS.Z1), the availability and accessibility of technology (ASS.J2), and the physical safety of the learner groups (FGP2; INT2). The majority of the participants used the materials they developed/adapted in many different ways and with a wide range of learner groups (see Sections 4.2.2 and 4.3 for examples). In doing this, according to the tutors (FGT), most all the participants have developed learning programmes on which their materials were used by different learner groups. This seems to have enabled the participants to think about different learning processes and to develop a "… deeper understanding of how learning support materials can support teaching and learning processes … rather than just practical skills [e.g. develop a fact sheet, writing an audit sheet]" (FGT).

4.4.3. Narration of practice

The narration of practice by the course participants while undertaking their assignments is most evident after the assignments have been completed and reported. The reporting usually takes two forms, firstly as a written report which is provided as part of the assignment work, and secondly as a verbal report which is presented during the ACEE contact sessions. This reporting process seems to be supported by the guidelines provided on the course modules which state that participants "… should prepare an audit report outlining the process and outcomes of the audit …" for Assignment 1 (MOD1:8) and "report on the problems and successes with the [biodiversity] pack" in Assignment 3 (MOD3:9). It is evident that in the narration of their practice participants had a tendency to provide a **descriptive report** of the assignment work (e.g. activities undertaken and results obtained) (AM2; AM3). In the majority of the cases the descriptive report included providing background information on the chosen issue/species, purpose of the audit/pack, sample of materials developed/adapted, evidence of learners' work and links to the course readings and other course materials (AM3).

All the participants provided background information on the issue/species they worked on and most of them explained the purpose of conducting an environmental audit or developing a biodiversity pack (AM3). For example, Joan, Abel and Zola provided some background information on environmental auditing and stated the purpose of their audits (ASS.J1; ASS.A1; ASS.Z1). For Assignment 3, Joan provided information on the plight of the Eastern Cape rocky and the purpose of her biodiversity pack (ASS.J2) while Zola provided some generalised information on the status of cycads as well as its characteristics (ASS.Z2).

Samples of the materials participants developed/adapted, as well as evidence of learners' work, were included in participants' reports and assignments (AM3). Examples of learners' work include photographs, completed worksheets, drawings and questionnaires. Apart from examples of learners' work, which seem to be important in providing evidence of learners' participation in the assignment work, the Advanced Certificate in Environmental Education course participants made clear links between their assignments and the course

materials, particularly the readings and materials in the resource packs (e.g. environmental fact sheets, HIPPO dilemma, Windows on the Wild materials) (AM3).

Another aspect that seems to be important in the process of participants narrating their practice is their ability to critically reflect[15] on own practice and to show evidence of **applied competence** (AM2; AM3). This seems to be consistent with one of the ACEE's aims which is to "… enable the development of [participants'] **applied** competence [which includes practical, foundational and reflexive competences] …" (emphasis on original, RUEEU 2002a:3). This seems to be evident in most of all the assignments where participants were able to develop/adapt materials (practical competence) (AM1), to understand and justify the reasons why a particular material was developed or a specific topic was chosen (foundational competence) (AM3) and, based on this, be able to improve/change own practice (reflexive competence) (ASS.J1; ASS.J2; ASS.A1; ASS.A2).

A clear example of participants developing their practical competence is evident on all the materials participants developed/adapted (see Section 4.2.1) (AM1). More concrete examples of foundational competences include the justifications provided by Joan on why she developed her audit sheet in a way that people would easily understand and not be put off by the number of questions (INT1; ASS.J1) and Abel's reasons for visiting the Apies river before developing the questions for his worksheet (INT2; ASS.A1). From the data analysed there is no evidence of reflexive competence in the assignments, however, it was possible to notice some examples of reflexive competence through wider research interactions. Examples include the recognition of the influence of research, discussions with colleagues on assignments, and the need for more time to be spent on such activities (FGP2). Joan suggested that based on what she learnt in her assignments she would change the activities to better suit the needs of her learners groups (INT1). Abel also realised that in the river audit activity some participants did not work as he planned and thus in the next time he would plan it differently (INT2). He further noted that his experience in undertaking the assignments has enabled him to improve his educational programmes (INT2).

When analysing the assignments for the development of the case stories it was possible to note that only one participant provided some interpretation of the audit findings and made general recommendations (AM3). Perhaps this issue is because the assignment guidelines required an interpretation of the findings and the proposing of recommendations was not explicitly requested. Although this might add another level of complexity to the assignment, it might be important to provide some information relevant for further action-taking activities that could contribute to participants' applied competence (see Chapter 6).

[15] In the context of the ACEE critical reflection is aimed to "… critique so as to develop a better understanding of our practice" and it is considered as an important idea underpinning the course (RUEEU 2002a:8).

4.4.4. Assignment Support

The support provided for assignment work within the context of the Advanced Certificate in Environmental Education seems to be outlined in different ways, namely through on-course tasks; tutor support and comments; support from work colleagues and professionals working on the field; and workplace context and materials (AM2; AM3).

According to the course tutors the assignments were often a practical implementation of aspects discussed and dealt with in the course sessions (FGT). To achieve this practical implementation a number of **on-course tasks** and activities were planned to make the links between the on-course tasks and the workplace-based assignments more clear (FGT). This seems to be evident in how participants' experience assignment work, many agreeing that the on-course tasks scaffolded their workplace-based assignment and were thus an important type of assignment support. Participants seem to concur with the tutors when noting that the practical activities done in the course (e.g. ecology study, interviewing community members; discussing the HIPPO dilemma) were relevant to the assignments (FGP2; FGP3; INT1).

Tutor support and comments were also used to provide assignment support to the participants (AM2; AM3). However, there are not many participants who requested tutor support and comments (FGT). The apparent reason is that most of the participants do not reside in Grahamstown and there is little opportunity for comments to be made within the same assignment period (FGT). Tutors are concerned about this and believe that participants should have an opportunity to improve their work within the same assignment, but also recognise that such approach can be time-consuming and expensive from a travel point of view (FGT). Most of the participants consulted the tutors during the contact sessions and before they left Grahamstown (FGP2; FGP3), although only one participant – who mentioned having contacted the tutors after the sessions to clarify issues and get support for her assignment (FGP3; INT3). Another participant noted that the comments received from the tutors are very insightful and helped one to reflect on practice (FGP3). The tutors believe that the comments made as part of the assessment procedure helped participants' with future assignments, as well as preparations for their exams and in some cases improved their workplace competence (FGT).

Another important feature of assignment support in the ACEE seems to be the support participants get from work colleagues and from professionals working in various fields (AM2; AM3). This support takes the form of discussion between course participants and their work colleagues about the topics for their assignments (FGP2; FGP3), obtaining advice on what materials to read and who to contact (FGP2; FGP3), seeking clarification on complex environmental terminology (FGP2; FGP3) as well as obtaining up-to-date information relevant to their assignments (FGP1; FGP2; FGP3). Joan, for example, discussed her ideas with, and obtained

relevant information from, staff at the Albany Museum (FGP3) while Zola drew on work colleagues and on a number of professionals working with cycads when undertaking her Assignment 3 (INT3).

A final form of assignment support available in the ACEE is the workplace context and materials (AM2; AM3). As participants are encouraged to undertake their assignment work in their workplace-based context (MOD1; MOD3), they often use their workplace support structures such as colleagues and facilities to help with the assignments (AM2; AM3). For her Assignment 3, Zola used the printing facilities and the Cycad Camp accessible in her workplace to produce her materials and implement them in a number of activities at the camp (FGP2). Participants also draw on materials existent in their work to support their assignment work (AM2; AM3). One participant clarified, in some detail, how she drew on materials from her institution to support her assignment work (FGP1).

4.5. Analysis of course design and course implementation

The second layer of data analysis enabled me to develop four thematic categories which are related to course design and implementation (see Section 3.5.2). These four thematic categories include:

- Course orientation (4.5.1);
- Course materials (4.5.2);
- On-course tasks and activities (4.5.3); and
- Assignments and work-away tasks (4.5.4).

Summaries are presented below to describe the main issues that emerged in the focus group interviews with the course tutors and developers as well as the issues evident in the course modules (see Appendix 8).

4.5.1. Course orientation

An *Introduction and Orientation* (RUEEU 2002a) text to the ACEE is provided to course participants at the outset of the course. This text provides an overview to the course, its rationale, the course curriculum and its outcomes. It also presents some important ideas underpinning the course. These include the history and context; critical reflection and reflexivity; the social construction of meaning; and aspects of theory and practice (RUEEU 2002a). The ACEE has been developed to "… reflect the requirements of all new teacher education qualifications, as defined by the *Norms and Standards for Educators Policy* [emphasis on original]", particularly in relation to the seven roles for educators (RUEEU 2002a:2).

Another important feature of course design and implementation through the Advanced Certificate in Environmental Education is its focus on applied competence (see Section 2.7), resource-based learning (see Sections 1.3 and 2.6) and research-based implementation (RUEEU 2002a). This section will focus only on aspects of course design and course implementation particularly in relation to the two modules analysed, namely Module 1 on *Environment and Environmental Issues* (MOD1) and Module 3 on *Contemporary Environmental Issues* (MOD3). These two modules highlight the orientation of the course within a resource-based learning approach (CT).

According to the data (AM4, see Appendix 8) the course orientation includes the definition of specific outcomes for each module; a brief introduction to each topic with specific links to readings, resource packs and assignments; guidelines for assignments and assessment procedures; and a number of course activities which include work-together tasks and tutor support.

As a way of orienting participants to the course, participants receive **orientation texts** for each module with clearly stated outcomes and introductory topics which seem to be specific to each module (MOD1; MOD3). The course tutors note that the orientation texts and the course readings are key materials for the course (FGT). **Assignment guidelines**, which seem to be very useful for participants' assignment work (see Section 4.2.1), and **assessment sheets** are provided (MOD1; MOD3).

Apparently there are clear links between the outcomes of each module, the assignment guidelines and the assessment sheets (CT). This is supported by the tutors who note that each assignment has an assessment sheet which focuses on some of the skills and outcomes that participants are required to develop during their assignment work (FGT). The specific outcomes, assignment guidelines and assessment criteria have been developed to help the participants to understand what is expected from them to and map their own learning in the course (RUEEU 2002a). Although pre-determined outcomes are used in the ACEE, the course design also allows for 'unexpected' outcomes to be evolved based on the outcomes and progress of the course implementation process (RUEEU 2002a).

Course activities, including work-together tasks and tutor support during contact sessions are also an important aspect of course orientation in the ACEE (see Sections 4.2.1 and 4.4.4). The course activities are based on curriculum deliberations which allow the participants and tutors to make collaborative decisions on how the course can best meet participants' needs (RUEEU 2002a). For the tutors (FGT) the course activities provide participants with an orientation to each module and respective assignment. For example, during a contact session, a number of activities focusing on the different types of curriculum were conducted and these

proved significant for one of the participants' assignments (FGT). The links between the orientation texts, readings and assignments are often made by the tutors during the sessions (FGT).

4.5.2. Course materials

A range of course materials are provided to the ACEE course participants. These include orientation texts for each module; readings related to the different topics; additional learning support materials; resource packs; and guidelines for the examination (AM4; RUEEU 2002a). In the two modules analysed, these materials seem be designed to allow resource-based learning, as participants are requested to "… explore how a range of learning support materials and other resources can be applied to support environmental learning in different contexts" (RUEEU 2002a:5).

As explained above (see Sections 4.2.1 and 4.4.2) the course materials are vital for the assignment work participants undertake. The **orientation texts** provide an orientation to each module by emphasising the main outcomes of each module, presenting the key ideas on the module, clarifying the assignment tasks and presenting the assessment criteria (CT). The **course readings** expand on the key ideas highlighted in the orientation text and "… have been carefully chosen to illustrate important dimensions …" of the topics of each module (MOD1:5). A number of **additional learning support materials** have also been chosen "… to provide [participants] with the tools to undertake learning activities with a group of learners [and] … to improve the quality of the teaching and learning interactions" (MOD1:5). Another reason for additional learning support materials is presented by the course developers who note that "… because not every teacher will do the same thing …" there was a need for a wider variety of materials (FGD).

The other two important course materials provided to the participants are the resource packs and guidelines for the examination. The usefulness and role of the **resource packs** in supporting participants' assignment work was discussed above (see Sections 4.2.1 and 4.4.2). However, it is important to mention that the course developers see the resource packs as tools provided "… to design and adapt and use materials" (FGD). The resource packs are also perceived as an important component of resource-based learning (FGT) and influential in participants' assignment work (MOD1; MOD3). An important aspect raised by the course developers is the fact that preparing resource packs it is not "… just a case of taking resources and using them, it was actually giving them [the participants] the tools to be able to do …" their assignments (FGD).

Lastly, **guidelines for examination** are also provided as course materials. The guidelines seem to be influenced by the other course materials as well as by the assignment tasks. These are provided to give participants some ideas on how to prepare for the examination and provide some possible questions to assist

participants in preparing for the exam (MOD1). The guidelines for examination require participants to make links between the course materials, the resource packs and their assignments (MOD1; MOD3).

4.5.3. On-course tasks and activities

Another important feature of course design and course implementation in the ACEE is the use of a wide variety of work-together tasks; the focus on participants' context; a strong emphasis on participants' workplace; and the support tutors provide for such tasks and activities (AM4). Some of these issues were discussed above as part of participants' experience of assignment work, namely the focus on participants' context (Section 4.4.1), course activities prior to the assignment work (Section 4.2.1), on-course tasks and activities (Section 4.4.3), and the use of the workplace and tutors as a form of assignment support (Section 4.4.3).

As stated by the tutors, there are a number of **work-together tasks** that participants undertake during contact sessions as part of the learning process towards achieving the pre-established outcomes, conducting their assignments and developing skills (FGT). Some examples include sessions on the HIPPO dilemma and different types of curriculum (FGT) and activities such as ecology study and the interviewing of community members (FGP2). Other examples of on-course activities planned as part of the course design and implementation for Assignment 1 include an investigation of "… the nature of a range of different environmental issues, by exploring these through using a conceptual model …" (MOD1:2), analysing fact sheets "… with a view to identifying the different dimensions and aspects of an environmental issue" (MOD1:3). In Assignment 3, for example, a "… fieldtrip in Grahamstown to explore the State of the Environment in Grahamstown" was planned as a work-together task (MOD3:3). This activity was based on a prior group tasks where a tool system for reporting on the 'State of the Environment' was introduced (MOD3).

The focus on the **participants' context** and their **workplace** is evident throughout the course materials (AM4). The orientation text for the course module 1, for example, highlights the need for participants to focus on their local context while undertaking the environmental audit (MOD1) while in the course module 3 participants were expected to deal with biodiversity issues relevant for, or evident in, their context (MOD3). This was done with the view to enable the development of participants' applied competence and the application of their learning to their education and/or training context (RUEEU 2002a). The idea of contextual learning by using materials and information about what is happening in participants context is important for the development of participants' skills related on responding to local issues and context (FGT; RUEEU 2002a).

Tutor support during on-course activities was previously discussed (see Section 4.4.3). However, it seems important to reflect here the involvement of tutors in planning and conducting several activities during the on-

course tasks and activities. The tutor support here includes the presentation of the sessions and the ability to make links between the sessions, course readings and assignments. In recognition that these links might not be very clear on paper, the tutors try to make these links throughout the sessions (FGT). This seems to be consistent with one of the roles of the tutors which, according to the course developers (FGD), is "… to be able to select appropriate materials for a particular purpose …" and to relate these materials to the course activities.

4.5.4. Assignments and work-away tasks

The assignments and work-away tasks are an important part of the implementation of the course, particularly in relation to the assignment work and to the development of participants' applied competence. It is clear that through the assignments and its related work-away tasks, participants are able to engage in a number of activities important for the achievement of the specific outcomes for each module as well as for the realisation of the ACEE's outcomes. Much data has been presented in relation to the assignment work, namely:

- as part of a resource-based learning approach (Section 4.2.2);
- in the three case stories (Section 4.3); and
- reflected in the participants' experience of assignment work (Section 4.4).

In relation to the assignments, emphasis will now be place on the work-away tasks. Although these work-away tasks contribute to, and are part of, the assignment work, it seems important to also analyse them as independent activities which work towards developing participants' applied competence. These work-away tasks seem to be workplace focused including an applied focus/practical activity approach; the need for undertaking research; collecting evidence of work; and developing reporting skills (AM4).

Similarly to the assignments, the work-away tasks are workplace-based to enable participants to better understand their context and improve their work (RUEEU 2002a). This seems to be evident in the way participants undertake their assignments in a **practical** manner based on an applied focus which seems to consist, in general terms, in focusing on an issue, developing/adapting materials and using them with groups of learners in context (AM4). Thus, it seems evident that a workplace-based focus encourages participants to be engaged in practical activities as a way of applying theory in practice. However, for the practical activities to take place in a meaningful and structured way, participants need to engage in a number of **research** activities (AM2; AM3). These research activities appear to be important not only for the assignment but, as one participant noted, as contributions to a lifelong learning process (FGP1).

A number of skills and competences are also developed by participants who have to collect different types of **evidence** of learners' participation in their assignments as well as to be able to put this together in a coherent **report** (AM4). The evidence of learners' work is a prerequisite of the course design for each module (MOD1; MOD3) and such evidence is provided in the form of photographs, questionnaires, drawings, etc (AM3).

Another activity required in the assignments is a presentation of a report on the assignment work which has to include evidence of learners' work and their conceptualisation of the issues (MOD1; MOD3). This activity, which is carried out to provide evidence of how learner groups were involved in the assignment work and what they have always done (MOD1; MOD3), seems to enable participants to reflect on the assignment work and helps them to think about possible improvements in future assignments. A careful analysis and interpretation of such evidence may enable participants to better reflect on their practice.

4.6. Concluding summary

This chapter placed emphasis on the presentation of the data generated in this research. It started by providing a summary of the data that emerged from the focus group interviews with the ACEE course participants. This summary later enabled the development of a initial diagrammatic representation of a framework for resource-based learning processes evident in the Advanced Certificate in Environmental Education (Figure 4.1). This framework is described in some detail through drawing on evidence-based data (see Section 4.2.2).

By drawing on the summary (Section 4.2.1) and the diagrammatic representation three case stories were developed. The stories are then presented (Section 4.3) to provide a rich description on how participants engaged in the adaptive use of learning support materials in different contexts and to shed light on the thematic categories related to participants' experience of assignment work (Section 4.4). As a way of complementing participants' experiences, and based on a comparative table developed to clarify features of course design. Data was then presented that related to the thematic categories for course design and course implementation (Section 4.5).

The next chapter draws together the course participants' experience of assignment work and the features of course design and course implementation (see also Appendix 9) to provide a discussion of the research findings that emerged during this research process. This discussion will be done in order to clarify the relationship between these two sets of thematic categories and with a view to informing the characterising features of resource-based learning in the ACEE. This discussion will be positioned within current debates on professional development, particularly in relation to course development and learning support materials.

CHAPTER 5 – DISCUSSION OF THE RESEARCH FINDINGS

5.1. Introduction

Evidence of resource-based learning processes in the Advanced Certificate in Environmental Education (ACEE) was generated, compiled and examined in Chapter 4. The first interpretation of emerging data (see Section 3.3.1) enabled the development of an initial diagrammatic representation of resource-based learning (see Figure 4.1 and Section 4.2.2). The developing picture was then reviewed within three individual case stories of course participants engaged in the adaptive use of learning support materials in different contexts (see Section 4.3). The case stories and diagram reflected thematic categories within participants' experience of assignment work (see Section 4.4) as well as course design and course implementation (see Section 4.5).

In this chapter the thematic categories on course design and implementation, and on participants' experience of assignment work are examined to probe the relationship between these (see Section 5.2) with a view to identifying and refining characterising features of resource-based learning in the Advanced Certificate in Environmental Education (see Section 5.3). A descriptive synthesis of the features is derived from the data generated within the case study. This allows a refinement of the initial diagrammatic representation of resource-based learning (see Section 5.4).

5.2. Relationship between course design and participants' experience

In order to develop a better understanding of resource-based learning processes in the Advanced Certificate in Environmental Education, I interpret and discuss the data presented in Chapter 4. Through the interpretation of the relationship between course design and course implementation, and participants' experience of assignment work (see Appendix 9, Analytical Statement, AS), six characterising features of resource-based learning in the Advanced Certificate in Environmental Education became apparent (see Section 5.3). The features are initially presented separately (see Section 5.3) and later in the form of a diagrammatic representation (see Section 5.4) for an overall picture of resource-based learning processes and the interrelated features identified in this study. It is important to note that the features emerging from the data are particular to the case of the ACEE. The features illustrated in the refined diagrammatic representation (see Figure 5.1) are, however, an enriched expansion of the initial diagram developed in Chapter 4 (see Figure 4.1).

The relationship of the thematic categories is evident in the course design and implementation, notably in how course participants, through following the guidelines provided by course tutors, have to a large extent, attained

the intended outcomes of the resource based learning approach implemented in the Advanced Certificate in Environmental Education (see Appendix 9).

The six characterising features reflect how what was planned by the course developers and tutors and initiated in deliberation with the course participants, emerged in the unfolding processes of resource-based learning (Appendix 9). The features arising in the research data are closely interrelated, providing a useful picture of the dimensions of this case of a resource-based learning approach to professional development (Figure 5.1).

The course design, for example, placed a strong emphasis on participants' local context (MOD1; MOD3). The study indicates that this is made evident in the workplace-based assignments when all the participants developed their assignments in a work context with a focus on local environmental issues and species (AM2; AM3). This emphasis can also be noted in resource packs which were developed to support assignment work with provision for their development and adaptation (FGT; FGD; MOD1; MOD3). These data illustrate that all the participants drew on the resource packs for their assignment work (AM2; AM3). Assignments in the ACEE were designed to focus on participants' workplace context (AM4). It is apparent that all participants developed their assignments in their work/home context and drew substantially on work colleagues, infrastructure and materials (AM2; AM3).

The evidence also indicates that, in undertaking their assignment work, participants were engaged in the adaptive use of learning support materials (AM2; AM3; AM4). This had them focus on contextual issues, undertake research, draw on the resource packs, deliberate assignment possibilities, conduct assignment work in their workplace and improve their practice (AM2; AM3). Participants developed applied competence through the narration of their practice and this is evident in how they critically reflected on their assignment work (AM4). Evidence of applied competence and critical analysis is also evident in participants' assignments and reports (AM3). The course was designed to be practice-based in order to encourage skills development, praxis and lifelong learning (RUEEU 2002a). Evidence in participants' assignments of their ability to relate theoretical ideas discussed in the course to the practical implementation of their assignments suggests developing skills and processes of continuing education (AM2; AM3).

The above outline illustrates how all the evidence began to build a closely intermeshed picture of the interrelated dimensions of the course. Below I provide an overview of the emerging evidence of these features that characterise the Advanced Certificate in Environmental Education, with links to current debates on resource-based learning and professional development.

5.3. Characterising features of resource-based learning

As explained above, the analysis and interpretation of the relationship between course design, course implementation and participants' experience of assignment work became evident in six characterising features of resource-based learning within the ACEE (see Appendix 9). The features include:

- Deliberating contextualising focus (5.3.1);
- Resource packs (5.3.2);
- Workplace-based assignments (5.3.3.);
- Adaptive use of learning support materials (5.3.4);
- Reflexive narration of practice (5.3.5); and
- Practice-based orientation (5.3.6.)

The clarifying of these characterising features within the overall picture (see Figure 5.1) begins to allow an understanding of the course design and its implementation, particularly with regard to how course participants were engaged in adaptive use of learning support materials in their work contexts. Below I present and discuss in more detail these features and a developing sense of the importance for resource-based learning processes in the professional development setting of the ACEE. The features are based on the statements developed based on my interpretation of the data presented in Chapter 4 (see Appendix 9).

5.3.1. Deliberating contextualising focus

The Advanced Certificate in Environmental Education was designed to encourage ongoing curriculum deliberation processes where course participants are actively engaged in making collaborative decisions on how the course can best meet their needs (RUEEU 2002a). This seems to have been achieved through a resource-based learning approach that recognises the need for course participants to deliberate, with course colleagues, tutors and peers, options and topics for the contextualising focus of their assignments (AS). It has been noted that ongoing curriculum deliberation processes are important for courses which are responsive to a diversity of course participants and to diverse environmental issues and risks (Lotz-Sisitka 2003). The deliberative nature of the ACEE course curriculum seems to be in line with current debates on curriculum deliberation as an ongoing and open-ended process (Lotz 1999; SADC REEP 2002). Such a process appears to encourage participants to play a significant role in "… defining their own learning … [through] engaging processes of **contextual deliberation in and around developing patterns of socio-historical interaction and emerging risk** [emphasis on original]" (Lotz 1999:8).

The deliberating focus is notable in case evidence of activities served to engage participants' prior knowledge in an ethos where their ideas were mediated in consultation with peers on the course (see Sections 4.5.1 and 4.2.2). There is also evidence of how ACEE course participants were encouraged to make active contributions by sharing their work experience with course and work colleagues (AM4). Janse van Rensburg and Le Roux (1998) note that through deliberation and research in context, participants are able to identify relevant local environmental issues that need to be addressed. This seems to be consistent with Robottom's (1987a:297) principle of enquiry-based professional development where all environmental education practitioners should "… adopt a research stance to their own environmental educational practices". Taylor (2003:13) also supports this proposition, noting that engaging participants in researching activities and sharing processes of exploration and enquiry "… will usually have greater effect in terms of enabling meaningful social change". The involvement of participants in such activities encourages learners to take responsibility for the learning processes (see Chapter 2).

Of particular note was how participants' assignment work informed their own practice (AM2; AM3; AM4). For this, on-course activities and assignments were planned so participants could work towards improving educational activities conducted in their workplace (AM4; CT). The role of learning processes such as these is acknowledged by Janse van Rensburg and Le Roux (1998) who note that an understanding of the complexities of environmental issues in a workplace context appear to contribute to professional development and increase the confidence of course participants. The data gathered in the study also indicate how participants were able to develop self-confidence and to grow professionally in many different ways (see Section 4.2.2).

The importance of contextuality, responsiveness and an understanding of local environmental issues were emphasised as important aspects of professional development courses (see Chapter 2). Notable in the assignment work was the emphasis on the development of contextually relevant learning support materials in response to local environmental issues (AM4; CT). Here, participants' assignments and work-away tasks focused on responding to local environmental issues which were relevant to their context (AM2; AM3). This seemingly enabled them to understand their local environment and to make informed decisions on appropriate action (AM4). In compiling cases of course development in southern Africa, Lotz (1999) found that course development seems to be guided by the idea of responsiveness to circumstances and context, where course participants deliberate with peers and learners to be able to respond adequately to their complex local environmental issues (Lotz 1999). In evaluating a semi-distance course in South Africa, Janse van Rensburg and Le Roux (1998:83) found that a better understanding of local environment can be seen as a form of praxis, particularly "… when the way in which we work is affected by and affects our understanding".

While undertaking their assignment work, course participants were also encouraged to consider the learner groups they worked with, and to involve them in teaching and learning activities (see Section 4.2.2; CT). In doing this, the course developers appear to have recognised that collective action is likely to be more productive and successful, particularly when participants can get support from work colleagues (Robottom 1987a) then simply working individually. This approach to assignment work has been found to encourage participants to work with others "… in their work environments, extending participation beyond the course" (Lotz 1999:25) and to enable participants to make better pedagogical choices through interacting with learners in socio-ecological contexts (Lotz-Sisitka & Raven 2001). Notable in the case evidence is how course participants worked with, and involved, diverse learner groups and colleagues in the development of their materials and planning of activities (see Sections 4.3 and 4.4.1).

5.3.2. Resource packs

Another significant finding in this study is that resource packs are an important feature of resource-based learning in the ACEE (see Section 4.5.2; AM4). The packs were designed as tools to support course participants to develop and adapt learning support materials (FGD; FGT). The resource packs provided background information, guidelines, examples of materials, and steering ideas for the development and adaptation of materials (AM2; AM3). Lotz-Sisitka and Raven (2001) note that resource packs such as these are useful in that they provide educators with practical ideas and tools for the development of learning programmes and materials to support teaching and to support the professional development of educators.

Samples of materials were included in the packs to enable participants to select and adapt/develop more appropriate ones to be used in diverse contexts with groups of learners (CT). According to Parsons and Gibbs (1994:11) resource packs are often used in resource-based learning processes to encourage participants to use the materials "… in flexible ways as they tackle extended learning tasks or projects". The resource packs in the ACEE seem to have been developed as a way of addressing the understanding that course materials are not the course but rather become tools to support learning (Janse van Rensburg & Le Roux 1998; Molose 2000). Janse van Rensburg and Le Roux (1998) further note that course materials play an important role in supporting professional development activities, and should be flexible enough to be adapted to other contexts.

The resource packs were equally important in enabling participants to engage in the adaptive use of learning support materials in diverse contexts, and thus are influential in participants' assignment work (see Section 4.4.2; AM4). This is supported by Janse van Rensburg and Le Roux (1998:97) who note that "… the experience of working on a resource, usually with others (the process), can even be more valuable than the resource itself (product)". Lotz-Sisitka and Olivier (2000) have also found that contextualised approaches to

professional development, such as resource-based learning, require the provision of a range of flexible learning support materials (in the form of resource packs) from which educators can select and adapt/develop for use in their local context. Czerniewicz *et al* (2000) argue that for this to take place, educators need to interact with people and have access to materials. This seems to allow course participants to develop a better understanding of the learning process and of how learning support materials can improve local relevance and promote lifelong learning (Bleakley & Carrigan 1994; Czerniewicz *et al* 2000; Raven 2003).

The processes of adaptive use of learning support materials appear to enable course participants to develop a number of skills and applied competence (see Sections 4.4.3 and 4.5.3) and to begin to address issues associated with materials development in southern Africa (see Section 2.5.2). These processes seem to have encouraged course participants to take up some of the roles outlined in the *Norms and Standards for Educators* policy statement (RSA 2000), notably as learning mediators, designers of learning programmes and materials, researchers and lifelong learners. The different roles and associated applied competence were evident in the ACEE where course participants exhibited an ability, for example, to adjust teaching strategies to cater for diverse learner groups, to adapt learning support materials for their contexts and learner groups, to apply research meaningfully, to reflect on knowledge and experience of environmental issues and to adapt their own practice (see Section 4.3).

5.3.3. Workplace-based assignments

According to Dorrell (1993) resource-based learning can be more easily integrated with course participants' daily work activities and by doing so, promote lifelong learning and contextual learning, as well as contribute to their professional development. It seems that this consideration is behind the development of workplace-based assignments in the ACEE. To support this, on-course tasks and activities were planned to scaffold participants' workplace-based assignments (see Section 4.5.3; AM4). These were designed as a practical implementation of issues discussed in the course sessions and ideas presented in the course materials, where participants are required to apply what they learned in the course to their work context (RUEEU 2002a). Raven (2003:189) notes that this can be achieved through workplace-based assignments as they "… play a significant role in providing the space for articulating the understanding that shapes the practice" as well as for applying learning to practice.

An evaluation of a semi-distance course guided by the notion of workplace-based assignments has concluded that professional development is linked to "… practical skills, personal growth, greater confidence often associated with building supportive relationships, a greater awareness of available resources, and a critical orientation to existing theory and practice" (Janse van Rensburg & Le Roux 1998:1). This seems to be evident

in the ACEE where participants undertake their assignment work with a view to applying, in their work context, what they learned in the course, and to make links between the course materials and their assignments (see Section 4.4.3; AS). Evidence indicates that this has resulted in participants' skills development and professional growth (AS). The workplace-based orientation also enhanced participants' ability to develop/adapt materials, and to relate theory and practice in their work context (AS; AM2; AM3). As mentioned earlier (see Section 2.3) the praxis-oriented approach of professional development courses has led to the recognition of the relationship between theory and practice in promoting lifelong learning.

Another important aspect of workplace-based assignments is an orientation towards improving/changing participants' practice (AS). Participants have recognised that by focusing on their workplace, they were able to critically reflect on their educational practice and based on this were able to improve/change their work (see Section 4.4.3; AS). This seems consistent with Raven's (2003:144) point that workplace-based assignments encourage "… the development of various aspects of professional development that support a reflexive review in/of practice". The reflexive narration of practice will be discussed in more detail in Section 5.3.5.

As illustrated earlier, workplace-based assignments also encouraged participants to draw on materials available in their work contexts as well as on their work environment (see Section 4.4.3). The data illustrate that participants drew on their workplace structure and materials when undertaking their assignments (AS). This enabled them to make more informed decisions about the topics/issues chosen, the relevance of the learning support materials produced as well as the type of teaching and learning activities employed with groups of learners (see Section 4.2). This praxis-oriented approach (acknowledging the intimate relationship between theory and practice) of the workplace-based assignments plays an important role in supporting professional development as participants draw on experience in work contexts to inform their steering action(s) in developing practice (see Chapter 2).

5.3.4. Adaptive use of learning support materials

The adaptive use of learning support materials is another important feature of resource-based learning in the Advanced Certificate in Environmental Education (see Section 4.4.2; AS). In the course, it emphasised the need for participants to, based on a range of existing materials, select, adapt/develop and use materials with a group of learners in specific teaching and learning programmes in their work context (AM2; AM3). According to Russo and Lotz-Sisitka (2003) such an approach seems to address the overemphasis on materials as the 'final product' and on technical details of materials development (see also Section 2.5). This approach highlights the importance of thinking about how to use the materials in context with groups of learners and emphasises learning processes rather than products (*ibid*.).

Resource packs and assignment guidelines for each module were provided to encourage participants to engage in the adaptive use of learning support materials (AM4). To complement these, course sessions and work-together tasks were planned to provide scaffolding for the assignment work (AM2; AM3; AM4). Thus, the use of resource packs within a deliberating contextualising focus and collaborative tasks for workplace-based assignments seem to have been important features, enabling the adaptive use of learning support materials. Czerniewicz *et al* (2000) note that it is through the adaptive use of learning support materials that educators and learners develop a sophisticated level of 'information literacy'. Information literacy is necessary for effective resource-based learning as a facet of lifelong learning (*ibid*.).

It is evident in the data that course participants drew on existing materials (in the resource pack, and from other places and sources) to adapt or develop their own materials (AM2; AM3). In doing this, they recognised the needs and contexts of the learner groups, and the relevance and appropriateness of the materials for their teaching and learning programmes (see Sections 4.3 and 4.4.2). Participants used the materials they developed/adapted in teaching and learning programmes in their workplace with groups of learners. It seems that resource-based learning in the ACEE was designed to enable the adaptive use of learning support materials. For Lotz-Sisitka and Raven (2001:96) such "… contextualised approaches to curriculum development require a flexible range of learning support materials that can be selected and adapted for use in local contexts". The data indicate that the resource packs in the ACEE provided this 'range of learning support materials' which were selected and adapted to be used in participants' work contexts in different teaching and learning programmes (see Sections 4.3 and 4.4.2).

As participants used their materials with groups of learners in their workplace-based contexts they critically reflected on how the materials were used with a view to improving them. It is thus evident that resource-based learning also recognises that the use of materials in context with learner groups should inform the redevelopment of these materials (AM4). This is supported by Russo and Lotz-Sisitka (2003:13) who note that the adaptive use of learning support materials in specific contexts to foster environmental learning involves an "… ongoing reflexive review of how learning support materials foster or enhance environmental learning" with a view to improving them.

It seems evident that through the adaptive use of learning support materials, participants developed a number of skills (see Sections 4.3 and 4.4.2). As noted above, through this process learners can develop information literacy skills which are important for materials development and to support lifelong learning (Czerniewicz *et al* 2000). Lotz-Sisitka and Raven (2001) note that it is important for educators to develop skills to select, use and adapt materials so that they can interpret curriculum documents. O'Donoghue and Janse van Rensburg (1995)

found that it was in processes of skills development that more local, more participatory and action-centred approaches to environmental education, such as an open processes framework for active learning, have emerged. To them (*ibid.*) processes of environmental learning seem to involve the contextual use of learning support materials through engaging dialogue (and encounter enquiry) and critical reflection (meaning-making) in specific environmental contexts in order to consider actions that might be taken to resolve problems.

Based on the above, it seems that processes of adaptive use of learning support materials provide a responsive, contextualised and participatory orientation to materials development and use. This helps to ensure that the materials developed/adapted "… are relevant to the contexts in which they will be used, which increases the likelihood that they will be used effectively and make a meaningful contribution to environmental education processes" (SADC REEP 2002:37).

5.3.5. Reflexive narration of practice

The reflexive narration of practice to inform and improve participants' work is another feature of resource-based learning in the ACEE (AS). In the ACEE this seems to involve a narrative account of the assignment work followed by a critical reflexive review of the assignment work with a view to improving or changing it. According to Sguazzin and Mhoney (1999), by reflecting critically on our educational practice and putting ideas into practice, educators are able to do things better. This is supported by Raven (2003) who notes that theory and practice are inextricably linked and as educators start to critically reflect and interrogate own practice, they can do things better. This praxis-oriented approach of assignment work is consistent with the outcomes of the ACEE as well as with the focus on the development of participants' applied competence (RUEEU 2002a).

The data also illustrate that the narration of participants' practice is done in two ways, namely as descriptive written reports of the assignment work and as formal verbal presentations in report back sessions during course contact sessions (see Section 4.4.3). To assist participants in preparing and writing the assignment reports, guidelines were provided (MOD1; MOD3). Such guidelines and on-course tasks encouraged participants to make links between the course materials (theory) and their assignment work (practice) (FGT; FGD). This praxis-oriented approach seems to enable course participants to carry the course learning into steering and interpretative use in their real world contexts (Lotz 1999).

The application of participants' course learning into their work contexts is evident in the links they made between course readings and assignments (AM3). In the narration of assignment work participants included examples of learners' work and materials they adapted/developed (AM4). This was requested by the course

tutors as a way of understanding how the praxiological nature of the assignments was contributing to the development of participants' applied competence (FGT).

In the ACEE, through a reflexive narration of their practice, participants are encouraged to critically reflect on their actions and apply possible changes in other contexts (MOD1; MOD3). The data illustrate that participants' critical reflection within their assignments was rather superficial, focusing mainly on the materials developed/adapted and less on the teaching and learning activities (see Section 4.3). However, by explaining the reason why they made certain decisions in terms of materials development, the choice of contexts and learner groups, participants were able to initiate a critical review of their developing practice (see Section 4.3). In a similar environmental education course it was found that through an "… exploration of the 'why' question that lies within the 'what' and the 'how' of our work" participants are encouraged to question the way they do things thus feeding back into their practice (Janse van Rensburg & Le Roux 1998:104). In the ACEE, the questioning of participants' practice seems to enable them to explore different ways of working and contributed to lifelong learning.

The above observations appear to be consistent with Robottom's (1987a) argument that environmental education should be critical so environmental education practitioners are able to critique the environmental and educational values and assumptions that inform educational policies and their practice. This seems to reinforce the need for resource-based learning processes which encourage a reflexive narration of practice embedded within a praxiological assignment orientation with a view towards improving practice and applied competence (see Chapter 2). UNESCO (2002) notes that critical reflection is integral to professional development activities as it enables local contextual action and curriculum deliberation. This seems to be consistent with the deliberating and contextualising focus of resource-based learning (see Section 5.3.1) thus showing the interrelatedness of the different characterising features of resource-based learning in the ACEE.

5.3.6. Practice-based orientation

Resource-based learning in the ACEE emphasised the practical nature of the course and its assignments with a view to putting theory into practice and developing applied competence (AS). For this, assignments were seen as a practical implementation of issues discussed in the course sessions (FGT). Thus, the assignments were then designed to enable participants to apply to the context of their work what they learned in the course and to question the way they do things in a certain ways (AS). The role of assignments in supporting participants to do their work better through drawing on course materials has been recognised in many environmental education courses (Janse van Rensburg & Le Roux 1998).

The data indicate that a practice-based orientation encourages the development of skills that promote lifelong learning as well as the development of participants' applied competence (AS). The focus on applied competence is emphasised throughout the course and to support this, a number of activities were designed (AS). As illustrated in the case stories (see Section 4.3) participants' assignment work was very practical and enabled them to develop a range of skills and to play different roles as educators. This is evident in the assignments where participants developed/adapted materials, understood and justified the reasons why they did this in a particular way, and improved/changed their educational practice (see Section 4.4.3).

Robottom (1987a:297) suggests that "… a division of labour between 'practitioners' and 'researchers' should be abandoned". The practice-based orientation of the course and assignment work seems to address this issue as participants were engaged in fieldwork and research activities. These activities were undertaken with a view to improving or changing their educational practice and enabling participants to establish links between theoretical ideas evident in the course (AS). Through this practice-based orientation participants were able to be engaged in understanding the learning processes rather than simply developing practical skills (AS). The significance of practice-based courses was emphasised earlier in this study, notably their contribution to lifelong learning and to more effective course designs (see Section 2.4).

All the above seems to be consistent with Robottom's (1987a) principle which suggests that environmental education should be participatory and practice-based. This principle encourages practitioners to be engaged in processes of addressing the gap between what participants think they do and what they actually do; between what they want to do and what they are actually able to do in their particular own setting and context (*ibid*.).

The practice-based orientation of the Advanced Certificate in Environmental Education is visible in all the different stages of resource-based learning processes (see Section 5.4). This orientation firstly assumes a scaffolding role 'towards practice' by enabling participants to be engaged in curriculum deliberations and contextualised focus and to draw on resource packs (see Figure 5.1). Secondly, this orientation provides the support for 'in practice' assignment work, through the development of workplace-based assignments, adaptive use of learning support materials followed by a reflexive narration of practice (see Figure 5.1).

5.4. Refined diagrammatic representation of resource-based learning

Below is a refined diagrammatic representation (Figure 5.1.) of the resource-based learning processes apparent in the Advanced Certificate in Environmental Education. The diagram illustrates how resource-based learning processes appear to have enabled participants, through the use of resource packs and workplace-based assignments, to engage in the adaptive use of learning support materials in their work context.

The diagrammatic representation of resource-based learning processes in the ACEE was constructed to reflect the six characterising features discussed above (see Section 5.3). These processes encourage participants to focus on issues that are contextually relevant in their work by deliberating assignment possibilities with course colleagues and peers (1). This is supported by resource packs containing background information, steering ideas and sample tools for the assignment work (2). The deliberating contextualising focus and resource packs are then used towards the practical assignment work which is workplace-based and involves the applied use of earlier assignment work (3). In undertaking their assignment work in their workplace contexts participants have to develop/adapt their own materials and use them with pedagogical intent in teaching and learning activities with diverse learner groups (4). These processes of assignment work are reflexively narrated through some form of written and verbal reporting (5). The resource-based learning processes are practice-oriented aimed at enabling skills development, promoting lifelong learning and developing participants' applied competence (6).

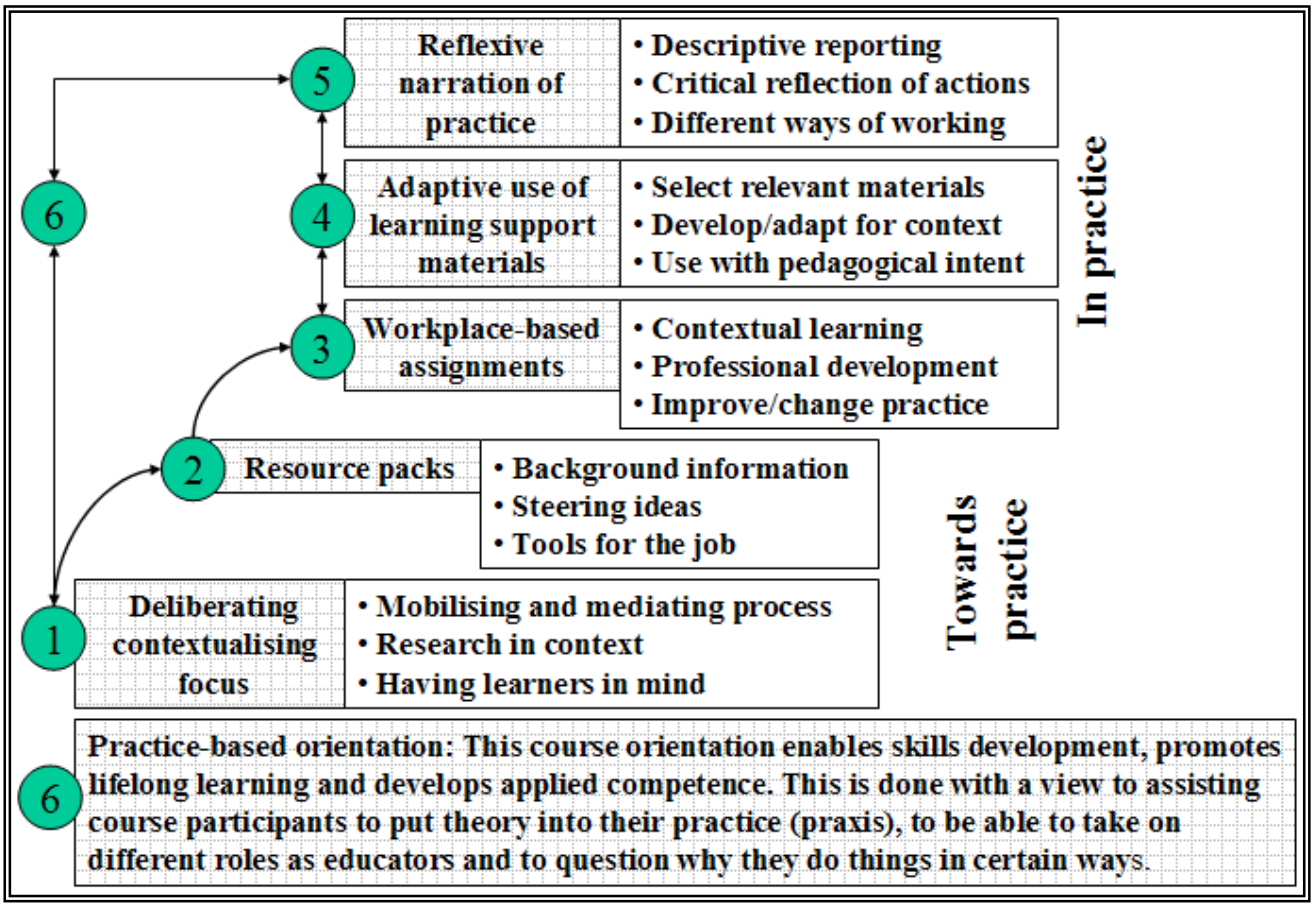

Figure 5.1. Refined diagrammatic representation of resource-based learning

The above diagrammatic representation of resource-based learning processes in the Advanced Certificate in Environmental Education is an expansion and refinement of and from the initial representation of resource-based learning constructed with the initial data and reported in Chapter 4 (see Figure 4.1). The revised picture

attempts to map out the main characterising features of resource-based learning in the ACEE, particularly the deliberation and the use of resource packs towards enhancing practice. The features are used as scaffolding stages for participants to be engaged in practical activities in their workplace while working with groups of learners.

5.5. Concluding summary

This chapter discusses the findings of this study in relation to the current debates on orientations to professional development activities, materials development and course development in southern Africa as presented in Chapter 2. The discussion is based on the characterising features of resource-based learning processes in the Advanced Certificate in Environmental Education as these emerged from the data (see Appendix 9). Each characterising feature is discussed with reference to aspects of course design and its implementation, and how such course design has enabled course participants to be engaged in resource-based learning processes.

As indicated, these features emerged from the data within this case study and were useful when clarifying the research aim and goals of this research. The features are distinctive to the Advanced Certificate in Environmental Education but have been informing other environmental education courses in southern Africa. Although these features are discussed individually in Section 5.3, they should not be seen in isolation but rather as part of a carefully outlined course design. For an overall picture of how these characterising features enable a resource-based learning approach in the ACEE, a diagram is provided (see Figure 5.1).

In the next chapter I will summarise this study. In doing this and based on the data emerging from this study I present two sets of recommendations. The first set is intended to enhance the Advanced Certificate in Environmental Education and thus draws on data within this case to recommend that course developers look in more depth at aspects of the course design when preparing subsequent Advanced Certificate in Environmental Education courses. The second set of recommendations is more general and is presented to enable broader generalisations for other course development initiatives. In doing this, I draw on the data from Chapters 4 and 5 to make 'fuzzy generalisations' (see Bassey 1999) for course development within the SADC Regional Environmental Education Programme.

CHAPTER 6 – CONCLUDING RECOMMENDATIONS

6.1. Concluding review

In this research, the Advanced Certificate in Environmental Education (ACEE) is considered as a single case study to shed light on processes of resource-based learning in a professional development course in environmental education (see Chapter 3). As explained earlier, a case study approach was employed with a view to identifying the characterising features of resource-based learning in the ACEE and so as to inform the development of more effective professional development courses in the SADC Regional Environmental Education Programme (see Chapter 1).

To locate this research within the current debates of professional development in environmental education and resource-based learning approaches, I initially reviewed the problems associated with course development and course implementation, as well as materials development in southern Africa (see Chapter 2). In doing this, I traced the emergence of resource-based learning approaches in professional development courses. Also examined was a recent shift from the term resource materials to the more focused concept of learning support materials (see Chapter 2).

The data generated through the research process enabled the development of an initial diagrammatic representation of characterising features of resource-based learning in the ACEE (see Figure 4.1). These data also contributed to the development of three individual case stories of participants' assignment work (see Chapter 4). Through three layers of data analysis, thematic categories of participants' experience of assignment work, and course design and course implementation emerged (see Chapter 3). All of these data were useful in the clarification of the characterising features of resource-based learning processes in the ACEE and used to refine the diagrammatic representation of resource-based learning in Chapter 5.

In Chapter 5, I discussed the six characterising features of a resource-based learning approach in the ACEE developing context. In doing this, I examined how a resource-based learning approach was addressing some of the issues raised in the literature review (Chapter 2), as well as achieving the goals of the ACEE. I have also indicated that the six characterising features emerging in the study are distinct features of the ACEE professional development process and thus should be interpreted in this context.

In this chapter I draw on the findings of this study (see Chapters 4 and 5), notably the characterising features, so as to make recommendations for the enhancement of the Advanced Certificate in Environmental Education and to indicate areas requiring further research. I also reflect on the characterising features of resource-based

learning arising in this case to consider how these might inform professional development courses being run and developed in the SADC REEP. A reflexive review of the research process is also provided. This is done by looking at the research design and the way this played out in the study.

6.2. Towards Recommendations

As explained earlier, the recommendations made in this chapter arose out of the data presented in Chapter 4 and the findings discussed in Chapter 5. The recommendations below are presented from two distinct perspectives. Firstly, from the vantage point of a researcher examining characterising features of resource-based learning within a case study of the Advanced Certificate in Environmental Education. These recommendations are made with a view to enhancing the ACEE, notably the way the course might be re-designed to enhance participants' assignment work and reflexive practice (see Section 6.2.1). Secondly, from the perspective of a critical reader of the case evidence, I make 'fuzzy generalisations' (Bassey 1999) to consider how the characterising features might be used to enhance professional development courses in the SADC Regional Environmental Education Programme (see Section 6.2.2).

In making the recommendations below I understand that there is an element of uncertainty and that these can only have a 'tentative approximation' in the data (see Bassey 1999). I am also aware that the recommendations may be read, interpreted and used by other people in different ways (see Chapter 3). Thus, it is not my explicit intention to initiate change but rather provide evidence-based arguments that might be useful to inform educational decisions related to course design and course implementation in the SADC Regional Environmental Education Programme.

6.2.1. Recommendations for the ACEE

The study illustrated that the ACEE should be seen in its developing context, particularly with regard to its resource-based learning approaches to semi-distance environmental education courses. It seems that through a clarification of the features that enable resource-based learning in the ACEE, it might be possible to better achieve the outcomes of the course, notably in strengthening the different roles played by educators and in supporting course participants to develop applied competence.

As this research was centred on the features of course design that enable resource-based learning, the recommendations to the ACEE are made based on the six features that emerged from the initial data and were refined and deepened in the developing study. It is important to note that each recommendation is

understood within the more refined picture of resource-based learning processes described in Chapter 5 and illustrated in the Figure 5.1.

6.2.1.1. Deliberating contextualising focus

One of the important findings of the course design in the Advanced Certificate in Environmental Education is the open-ended deliberative orientation which allows for participants to deliberate the course curriculum and topics for their assignment work with course colleagues, tutors and peers in work contexts so as to best meet their needs (see Section 5.3.1). Recognising that this feature plays a significant role in enabling learners to define their own learning I would like to recommend that:

- The ongoing processes of curriculum deliberation evident in the ACEE are enhanced and made more explicit in participants' assignment work, particularly in conducting research and planning of teaching and learning programmes;
- The ACEE should maintain the contextualising focus of the assignment work and work-together tasks but with more clear links to national and global policies;
- The course design should allow for a balance between the scaffolded guidance provided in the course design and course materials, and the participants' self-decision making process in the assignment work. This supports course participants to become supporters of other learners;
- Further research on deliberative curriculum processes within the assignment work is conducted.

6.2.1.2. Resource packs

This study indicated that the resource packs, designed to support course participants' assignment work, were influential in enabling the adaptive use of learning support materials (see Section 5.3.2). The resource packs were also significant in providing background information and examples of materials, and steering ideas for the development and adaptation of materials to be used in context. Based on these findings I recommend that:

- The resource packs provided need to be flexible and provide a range of options, ideas and materials for workplace-based assignments. These might enhance the consistency with a resource-based learning design that enables a scaffolding of the learning process as distinct from packs of materials found in other distance education courses;
- Great care is taken to ensure that the learning frameworks and the pedagogical intent of the materials in the resource packs are made explicit and clearly understood by the course participants. This might enable participants to give more thought to the pedagogical intent of the materials they develop/adapt;

- Strategies are put in place and guidelines are developed to encourage participants to review and re-develop the materials they developed/adapted after having used these with groups of learners.

6.2.1.3. Workplace-based assignments

As indicated in Section 5.3.3, through workplace-based assignments course participants were able to integrate course learning into their daily work activities and, in so doing, contribute actively to their professional development. The data indicated that workplace-based assignments promoted contextual learning. The study has thus suggested that a workplace-based assignment orientation can enhance participants' ability to develop/adapt materials, and to relate theory and practice in their work context (Janse van Rensburg & Le Roux 1998; Raven 2003). Drawing on these findings I recommend that:

- Explicit links between course learning and its application are more clearly made to participants' work context. This praxis-oriented approach might enable participants to be engaged in more contextual learning and promote the development of practical skills relevant to their workplace activity;
- Participants should be encouraged to show evidence of having used or drawn on materials available in their workplaces, having contacted and involved work colleagues and having made use of their work environment or facilities;
- The links between the assignment topic and its relevance to participants' work contexts are made more explicit. This might ensure that, apart from the assignment work being workplace-based, it will be of significant importance to the improvement of participants' workplace activity;
- Further research on how the learning from a workplace-based assignment contributes to the improvement of participants' work, lifelong learning as well as how their following assignments are undertaken.

6.2.1.4. Adaptive use of learning support materials

Another significant finding of this research is the focus on the adaptive use of learning support materials. In the Advanced Certificate in Environmental Education, it has been noted that through processes of adaptive use of learning support materials, course participants were able to select materials, adapt/develop and use them in specific teaching and learning programmes with a group of learners (see Section 5.3.4). The role of processes of adaptive use of learning support materials in supporting the development of contextually relevant materials has also been highlighted. Based on the findings of this research I recommend that:

- Strategies are developed to encourage participants to think about how they will use (the pedagogical intent) the materials they developed/adapted in context, with groups of learners. This is likely to encourage participants to focus more on the learning processes rather than on the technical skills associated with materials development/adaptation;
- Course participants should develop/adapt materials as part of broader teaching and learning programmes existent in their workplace-based contexts. This is to ensure that the materials are relevant to their workplace contexts and will be continuously used in such teaching and learning programmes.

6.2.1.5. Reflexive narration of practice

This research highlighted the importance of a narration of practice with a view to supporting a critical, reflexive review of the assignment work. This is done in order to improve or change participants' educational practice, to develop applied competence and to foster lifelong learning (see Section 5.3.5). The research also indicated that participants reported extensively on what they have done for their assignment work with little exploration of the reasons they have worked in a particular way. I therefore would recommend that:

- The reflexive narration of practice of participants' assignment work should move through descriptive reporting to more engaged, critical reflections to support actions, and decisions in the assignment process. This should enable them to question the work they do with a view to feeding back into their educational practice;
- Reflexive narration of practice should also embrace a critical orientation so as to open up different possibilities for diverse approaches to educational practice. Based on this, participants should be encouraged to look at different ways of viewing environmental issues and appropriate responses;
- Participant reports on assignment work should reflect the pedagogical dimensions of the use of the materials they developed/adapted in teaching and learning programmes;
- Participants should also be encouraged to provide an interpretation of the findings that emerged in their assignment work, with recommendations to address possible problems encountered. This can be done so that the assignment work can become a continued activity relevant to their workplace.

6.2.1.6. Practice-based orientation

The data indicated that resource-based learning in the ACEE was designed to emphasise a practice-based course orientation. Section 5.3.6 highlights how the assignments were seen as a practical implementation of issues discussed in the course sessions. The assignments were designed with a view to putting theory into

practice and developing participants' applied competence. Recognising that this approach encourages participants to take up different roles I would like to recommend that:

- The links between on-course tasks and assignment work are enhanced, notably with the use of course readings in support of the assignment process. These tasks could be both fieldwork and research-based;
- The ACEE should consider strategies for drawing on the lessons learned from the first year of resource-based learning to identify better ways of providing assignment support to participants;
- The scaffolding role 'towards practice' of engaging participants in curriculum deliberations and on the use of resource packs should be supported throughout the course. This might enable participants to understand that decisions on adaptive use and the reflexive narration of how materials are used are indicative of better practice.

6.2.1.7. Overall comments

It was notable that resource-based learning can be a very demanding teaching and learning process in professional development settings. It is extremely demanding for the course tutors as they have to engage in praxis-oriented activities that need to be contextually relevant to the diversity of participants' backgrounds and work contexts. It is also demanding for the course participants as they have to be engaged in a number of activities which require them to play out a number of roles as outlined in the *Norms and Standards for Educators* policy statement (RSA 2000).

It is important to recognise that the demands of the process in the case of the ACEE, seem to have contributed to a better understanding of learning in a developing context as well as to the development of participants' applied competence. The focus on the learning processes evident in activities such as adaptive use of learning support materials, workplace-based assignments and reflexive narration of practice as well as on the development of practical skills appears to have promoted a competence to think about and to narrate practice that many participants felt were lifelong learning skills.

It seems important to note that there is an ambiguous space in an assumption that, for things to be relevant, they must come out from the participants and their experiences, as tutors play a neutral facilitation role. However, in the ACEE there is evidence that tutors played a more engaged mediating role, notably as active co-commentators on participants' experiences in assignment work. Insights on the balance between a facilitation role and a more engaged, demanding mediator role in drawing out of meanings from participants' experiences is an area that needs more research.

It has also been noted that is was difficult for participants to reflexively narrate their practice. Although this research did not gather observational data on instances of participants reporting back their assignment work in the course contact sessions, it seems important that in the course design this activity is emphasised. A process of collaboratively drawing out meanings from the descriptions provided by participants is likely to be important for an enriched understanding of skills developed, as well as the decisions participants had to make in undertaking their assignment work in particular ways. Further research on these processes would also be useful for a better grasp of the importance of these processes as a characterising feature of resource-based learning processes.

Another area for further research seems to be how the reflexive narration of practice might enable an unfolding of participants' assumptions on adaptive use of learning support materials, particularly in relation to the pedagogical intent of their materials. As noted earlier, the narration of practice was mostly descriptive, thus a restructuring of the assignment guidelines to allow participants to use and describe what they are doing and what happened, with a view to interpreting and making propositions about the learning process should be undertaken.

The processes of resource-based learning in the Rhodes University Advanced Certificate in Environmental Education appear to constitute a break with the conventional wisdom of linear thinking that assumes that making people aware will change their behaviour and attitude. It provides opportunities for participants to be engaged in contextualised research and fieldwork activities which might enable them to better understand the socio-historical dimensions of environmental issues in their work contexts. This enables them to be involved in practical activities related to real life situations while making the links between learning in the course and workplace-based activities.

The resource-based learning processes in the Advanced Certificate in Environmental Education appear to create possibilities for the course participants to become the authority of their own learning. The course design allows for participants to break away from 'top-down', and often abstracted, orientations to learning to more cooperative and contextually relevant learning. This seems to enable participants to take ownership of their educational and workplace needs, and to develop skills and competences necessary to respond to the idiosyncratic nature of environmental issues and risks in a southern African context. This approach seems to enable participants to narrate their patterns of practice with a view to working towards better ways of doing things in their workplace-based contexts.

6.2.2. Recommendations for the SADC REEP

As mentioned earlier, the recommendations that follow are made as a critical reader of the case study evidence. This reading is undertaken in the form of 'fuzzy generalisations' (Bassey 1999), a signifying of propositions in the case that might usefully be related to my own work context in the SADC Regional Environmental Education Centre. The intention of my reading of the study is to provide general propositions for the development and enhancement of the developing suite of SADC environmental education courses. In doing this, I recognise the need for ongoing research to understand how these generalised propositions can actually support more meaningful and effective courses in southern Africa. Thus, these recommendations are made to shed light on course development processes where resource-based learning, workplace-based implementation and adaptive use of learning support materials might strengthen the SADC REEP courses.

It is also important to acknowledge that the recommendations below are drawn from the case of the ACEE, a semi-distance environmental education course reflecting resource-based learning as a contemporary response to problems identified in course and materials development. Thus, the implementation of these recommendations in residential or distance courses needs to be supported by ongoing research. Based on this I recommend that, in the development or adaptation of environmental education courses, the SADC Regional Environmental Education Programme:

- Considers the importance of focusing and drawing on participants' work context in the development of assignment guidelines. A focus on workplace-based assignments may enable participants to improve their education practice and also supports contextual and lifelong learning. This approach can also make the integration of course learning into participants' workplace-based activities easier and more productive. Another dimension of workplace-based assignments is the possibility of participants involving work colleagues in their assignment work and enabling a collaborative professional development activity;

- Explores the development of assignment and on-course tasks more centred on practical, workplace-based examples through the engagement in enquiry-based activities. These activities should involve the use of materials with others in context as a way of clarifying and making explicit the learning frameworks evident in these materials;

- Explores explanatory processes of reflexive narration of practice as a way of opening up possibilities for critical narratives. Encouraging participants to reflexively review and narrate their own practice can have the potential to enable them to improve their educational practice while questioning the reasons

and underlying assumptions behind particular ways of doing things. Such an approach might create opportunities for participants to develop critical thinking and reflexive skills important for the development of applied competence;

- Investigates the integration of processes of adaptive use of learning support materials, particularly in materials development courses such as the Attachment Programme. In doing this, participants need to recognise that materials development initiatives do not overemphasise the material as an 'end product' but rather as a resource to be adaptively used in teaching and learning programmes. An approach such as this might also contribute to the development of participants' research skills and would appear to promote lifelong learning;

- Investigates the possibility of drawing on resource-based learning approaches to professional development for the development of environmental education courses and materials. Resource-based learning approaches might be useful in supporting the development of skills and competences necessary to respond to the changeable and uncertain nature of environmental issues and risks in southern Africa;

- Looks at the development of flexible resource packs to support contextual learning. These resource packs could be reviewed according to the purpose of the course or training programme. Although this might be a time-consuming activity, the resource packs can provide the initial steering ideas and examples for participants to draw on, rather than starting from scratch.

6.3. Reflexive review of the research process

The data generation techniques used in this research were useful and when combined, through data and methodological triangulation, generated evidence that enabled the necessary insights for the identification of the characterising features of resource-based learning in the Advanced Certificate in Environmental Education.

The use of focus group interviews played an important role in reviving and deepening participants' memories related to the implementation of their assignments, stimulating discussion around the use of resource packs and the adaptive use of learning support materials. As for the focus group interviews with the tutors and course developers, the information gathered was important for this research, particularly in relation to the idea of resource-based learning and the uncertainty on how to approach it in the context of professional development courses. However, I believe that due to the small number of participants (two course tutors and two course developers), semi-structured interviews might have been more appropriate.

The use of semi-structured interviews was nonetheless very important in providing enough information to develop the three individual case stories that proved to be significant for probing more in-depth, detailed processes in the study. These research processes also enabled the triangulation of information regarding the process of assignment implementation that the course participants had undertaken. The open-ended nature of the questions used in the semi-structured interviews as well as the use of their assignments to stimulate ideas, proved to be essential in conducting the interviews that probed characterising features derived earlier in the study.

The use of audio recording for the focus group interviews and the semi-structured interviews was useful both in capturing finer details as well as in giving me more space and flexibility to concentrate in the discussions rather than being engaged in taking notes. It did not appear to be intrusive by the research participants and did not compromise or hinder their participation. However, depending on the voice level of each research participant, it was sometimes was very difficult to understand clearly what they said when playing back the tape. This problem was addressed by providing them with the summaries of the interviews so that the necessary changes could be made.

Document analysis has been a long but rewarding activity and has proven to be useful in helping to understand particular details of different cases and to provide detailed information about many processes relevant to this research. It has taught me that one needs to know clearly what one is looking for in the data otherwise it can be tiring and endless. Another lesson was the fact that documents can be abstracted from social reality and therefore it is important for these to be used in combination with other data generation techniques. In order to capture my ideas and thoughts about this research and emerging findings I have taken a number of notes. These notes proved to be important for the presentation and discussion of the data.

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A RESOURCE-BASED LEARNING APPROACH TO PROFESSIONAL DEVELOPMENT

– THE CASE OF THE ACEE

(RHODES UNIVERSITY ADVANCED CERTIFICATE IN ENVIRONMENTAL EDUCATION).

APPENDICES

Appendix 1 – Example of an interview summary **Abbreviation:** FGP1

Focus Group Participants 1 **Date:** 30 September 2002

Context: Rhodes University, Advanced Certificate in Education, Day One

Course Participants (pseudonyms): Pume; David; Sanele

Introduction

The participants were briefed on the objectives and purpose of the research. Based on this they have agreed to be part of the first focus group. The procedure for this focus group was the following:

e) Backgrounds of each participants
f) Discussion on Assignment of Module 3: Contemporary Environmental Issues (biodiversity study)
g) Discussion on Assignment of Module 1: Environment and Environmental Issues (environmental audit)

Summary of the focus group one (presentations)

Pume works in Pietermaritzburg at Umgeni Water as an educationalist. She visits schools from pre-primary up to tertiary levels and communities. The focus of her work is on water related issues (e.g. pollution, health and hygiene, sanitation). In her work they develop educational materials (posters, booklets, videos) for different levels of education.

David is a qualified teacher and works in Free State as an environmental education coordinator. His work entails helping subject advisers to produce and develop learning support materials. He also supports the professional development of teachers in supporting the integration environmental education in their classrooms.

Sanele is from Limpopo province working in the Department of Finance and Economic Development. He works in a number of focus areas such as environmental education (in the formal and non-formal sector); environmental education awareness (environmental days); capacity-building of communities and networking with other provinces and institutions.

Summary of the materials developed by course participants

Pume said that the HIPPO dilemma material helped a lot because she had to choose an endangered species and had to make links with the HIPPO dilemma (following the steps provided in the resource-pack). She chose the blue crane as the specie to work with. She identified a youth group (environmental club) and visited the Crane Foundation to collect more information on blue cranes. Local people and staff from the Crane Foundation were also interviewed to provide more insight on the topic. They (Pume and the group) went back to present the outcomes from the interviews and an action plan. A poster was developed to raise awareness of local companies and local people. A flyer on possible solutions for the identified problem was also developed (to be used together with the poster). A 'join-the-dot' activity and a 'crane saving game' were developed by Pume for young kids.

David focused on habitat loss and the elephant in the Free State. He combined the different materials from the pack and used the active learning framework as a guiding framework for his assignment. He believes that the materials from the pack are very useful and they encourage the use of other learning support materials. He adapted the materials to suit is context in the Free State and also the topic.

Sanele developed his own resource based on the information provided in the pack. For example, he drew on the environmental fact sheet on the wild dog to develop one on cheetahs (with some questions). In terms of the HIPPO dilemma, he used the same concept/idea/pattern and came up with a different dilemma (CHEETAH). In terms of the solution card he adapted his by giving more emphasis on the cheetah (providing more information to the learners). The added resource developed by Sanele was an introduction (guidelines) to his pack to help learners to use the pack. He thinks that this introduction is very important to guide the user of the pack and it was lacking in the original pack provided by the course. In the guidelines section and in all the materials there are some questions in the cheetah.

Summary of the use of the assignment guidelines

David agreed that they were useful because they gave him some focus. Sanele believes that they are considering the fact that some of the questions are repetitive, particularly in terms of the presentation and report of the assignment. *"You might think that some of the questions are repeating themselves, they are not clear"*. *"It is good to have guidelines and the resources because people might not really know how to use the resource, so once you have the resource one should really keep clear guidelines and simpler".*

Pume said that the guidelines are confusing maybe because English is her second language. She also emphasised most of participants were confused by the guidelines particularly in relation to how to report it. This led to people having to go back home with their assignments to rework them. Examples were giving by Pume and Sanele on the difficulties of understanding the guidelines. *"I was lucky because I wrote the first assignment I sent it to Pam, the lady that reviewed the assignment, and then she replied to me indicating that she was confused … they are saying you need to develop a pack and a report, it is always confusing, you don't whether the report is about the activities that you are doing or the report is about the all assignment"*. Later she got clarity from Pam.

Summary of the usefulness of the pack

For Sanele the pack helped him, particularly in terms of the information available and the ideas for other resources. He stated that it might help people to adopt some ideas and change slightly others to suit their own needs and context. Sanele had to look for more information and therefore he contacted institutions working with cheetahs. *"Generally the materials were very useful and give one background on how to start"*.

Pume did not use the same style of the learning support materials in the pack, but she developed her own learning support materials using information from the pack and other materials that she has at Umgeni Water. For example, the crane game was adapted from the 'water saving game'. *"The crane saving game I took it from our water saving game, because I was looking at this [the pack] and I could feel that the information about the blue crane is too limited, I can't write about this, that's why I thought of other activities around and I played around with and I came up with my own"*.

Summary of the most valuable experience

To David the most valuable experience was the development of his own resource by adapting and drawing on existing resources. He thinks that one of the important aspects of this activity is to be able *"… to take action in our own context … using own materials"*. This activity, particularly the research component, *"… research is a life-long …"* process where one is always learning. For that the questions must be open-ended so one can allow more interactions and more information sharing.

Sanele said that the experienced that he has gained is that *"… some of the materials you don't have to change you can adopt to your own context"* (adopting the patterns or styles of the given materials), or you can come up with different materials *"… meaning that one can use the resource materials in different ways, one can adopt and one can develop other materials drawing on ideas from others"* (as long as the material can be important for the learning in that local context). These materials (resource pack) provide a range of possibilities for the development of your own materials.

Pume said that she learned a lot from the research that she had to do (like going out to find information on blue cranes, interviewing people from KZN Nature, talking to people from the Crane Foundation). *"You learn a lot from research as well, rather than the resource material as such"*. She also learned a lot in terms of materials development, which make her see that is not difficult to develop her own materials. *"I didn't even get info on blue cranes only, about other things that I wasn't aware of, I mean I learnt a lot"*. The activity was demanding, challenging and interesting. She said that although it was confusing sometimes, one learns a lot at the end.

Final comments (the learning process)

Sanele feels confident with what he has done and believes that is now easier to do again the same type of assignment (he has gone through the process). This is a continuous learning process and he realised that he learned more because of the research that was required. And as learners one also learns from those ones doing research. *"… we realised that you learn more when you research something … you also learn from those you are researching with".* The pack provides materials that you work on them to be able to adapt to your own context. Sanele added that the course activities are conducted according to the course programme and assignments.

Pume said that it was relevant to involve the youth (which is from the community) and let them do the interviews, because they are the ones who will hear the problems from the local people and come up with the possible solutions. *"… let them [the youth] do the interviews, they are the ones who will hear the problems from the local people and they are the ones who came up with the possible solution poster … and the people understand much better from their neighbours, from their friends rather than I as a stranger coming from where I am coming from and then educate them, coming up with all these materials".* The lessons are that environmental educators should not try to 'give' solutions to people but rather work with the community to identify solutions. This task gives one the start, the background and the idea which makes easier to adapt from. *"Sometimes is easy if we go through the guidelines, the assignment task and the presentation inside the class, but once you go back and try to put it in practice that's where you get confused"*. She thinks that the problem is in writing and presenting the assignment.

David said that the resources helped to understand new concepts and gave some ideas for activities. It was useful to take some of the concepts and relate them to his context.

Note: All participants felt that the two resource packs had the same characteristics (background info, guidelines, ideas for adaptive-use of learning support materials). They also agreed that is important to have guidelines for the task as well as the resource pack. It is important to use existing resources (rather than duplicate them) to use or adapt to ones own situation.

Appendix 2 - Analytic Memo 1 (Summary of Focus Group Interviews with participants) Abbreviation: AM1

Background

Summarising the main issues pointed out by a group of research participants (course participants) during the focus group interviews (FGP1; FGP2; FGP3) in relation to the assignment work in the ACEE course for Assignment 1 on environmental audit and Assignment 3 on biodiversity. This was done to help in the construction of a diagrammatic representation of resource-based learning in two modules (Module 1 and Module 3) of the ACEE and to shed light on the assignment work.

Table AM1 – Main points of assignment implementation process

Main Points	Summary of Comments	Data Sources
Materials Developed (Topic/Issue/Species)	Blue crane; poster, game, flyer, activity	FGP1
	Habitat loss and elephant	FGP1
	Cheetah; environmental fact sheet	FGP1
	Cycads; environmental fact sheet	FGP1
	Eastern cape rocky fish; environmental fact sheet	FGP2; FGP3
	Soil improvement; worksheet	FGP2
	Cheetah; game	FGP2
	River audit; audit sheet and questionnaires	FGP2
	Stream audit; audit sheet and questionnaires	FGP3
	Chambo; questionnaire	FGP3
Use of Guidelines	Provide some focus	FGP1; FGP3
	Are repetitive and confusing; Difficult to follow	FGP1; FGP2
	Help in the development of the assignments	FGP2; FGP3
	Only used the ones relevant to own context	FGP3
Course Activities Prior to the Assignment	Ecology study was relevant and helped the assignment	FGP2
	Interviewing the community helped the assignment	FGP2
	HIPPO dilemma helped to understand issues	FGP3
	Sessions and course activities helped with the assignments	FGP1; FGP3
	Use of prior knowledge is relevant	FGP3
Usefulness of the Resource Pack	Useful and encourage use of learning support materials	FGP1; FGP3
	Give info and ideas for materials	FGP1; FGP2; FGP3
	Provide a range of possibilities/starting points	FGP1; FGP2; FGP3
Most Valuable Experience	Developing own resource	FGP1; FGP3
	Ability to take action in own context (with own materials)	FGP1; FGP3
	Research	FGP1; FGP2; FGP3
	Develop new ideas and obtain more information	FGP2; FGP3
Final Comments (learning process)	Learning by doing and research and continuous learning process	FGP1; FGP2; FGP3
	Involving others is important and work with others to identify solutions	FGP1; FGP2; FGP3
	Resources help to understand new concepts	FGP1
	People have different views on issues	FGP2
	Develop new ideas, views and information	FGP2; FGP3
	Discuss assignments with colleagues is useful	FGP2; FGP3
	Skills development (materials development, research, communication, reporting)	FGP1; FGP2; FGP3

Abbreviations for the data sources:

FGP – Focus Group Interview with Course Participants

Appendix 3 – Interview schedule for course tutors

Background

The questions below were used in semi-structured interviews with the two courses tutors from the Rhodes University Advanced Certificate in Environmental Education.

Questions

- What is resource-based learning?
- How is it reflected in this course?
- What is the influence of learning support materials in the implementation of the assignments?
- What are the skills that you hope course participants will develop by using the resource-based learning approach?
- How are the links made between the sessions, assignment guidelines, assignment implementation, report back and comments?

Appendix 4 – Interview schedule for course developers

Background

The questions below were used in semi-structured interviews with the two course developers from the Rhodes University Advanced Certificate in Environmental Education.

Questions

- How is the course structured to enable a resource-based learning approach?
- What skills are participants expected to develop based on the resource-based learning approach?
- What role does the educator/tutor play in the course?
- What materials are provided as part of a resource-based learning approach?
- How do you see participants' understanding of the concept of resource-based learning?

Appendix 5 – Comparative Table **Abbreviation:** CT

Background

Information on the materials provided to help course participants with their assignments is provided in a comparative table as a way of clarifying the course design and course implementation structure. These materials (MOD1; MOD3) included orientation texts (which provide an orientation to each module), readings (articles and papers), learning support materials (in the form of resource packs) and participants' assignments (ASS). These were used in two different ways, firstly to provide an understanding of the course design and course implementation and its relationship with the assignments, and secondly as a way of triangulating the data generated from both the focus group and semi-structured interviews.

Comparative Table

Module 1 (MOD1) Environment and Environmental Issues	Module 3 (MOD3) Contemporary Environmental Issues
Orientation texts (which provide an orientation to each module)	
Outcomes of this module ▪ Explain how you see environment ▪ Illustrate that environment is a socially constructed concept ▪ Show how different people may construct their understanding of the environment differently ▪ Draw on a model to illustrate key dimensions of the environment and environmental issues ▪ Demonstrate an understanding of the complex nature of environmental issues ▪ Conduct an environmental audit (1) to identify **environmental issues** in a local context of your choice (2) **My notes:** 1. Specific activity but with a broader scope (e.g. many aspects to be audited – not prescriptive) 2. Encourage the use of participants' local context and give them the freedom to choose an environmental issue	**Outcomes of this module** ▪ Demonstrate an understanding of key global environmental issues and how they manifest at the local level ▪ Demonstrate a critical understanding of the forces driving specific environmental issues within the SADC region ▪ Critique the concept of sustainable development and propose alternatives ▪ Develop an educational pack (1) for supporting learners in exploring and responding to local **biodiversity** issues (2) ▪ Use and critically analyse a state of environment reporting process to describe environmental issues in a local context **My notes:** **1.** Develop LSM (in a form of a pack) to be used with learners in exploring and action taking activities **2.** Focus on local context or local issues (e.g. local biodiversity)
Readings (additional text in the form of articles and papers)	
A number of readings (papers and articles) focusing on: ▪ Environment and environmental issues ▪ Environment and development issues ▪ Concepts of progress and sustainable development ▪ Waste **Some additional materials** ▪ **Environmental audit resource pack** ▪ Exploring the environment with pictures pack ▪ Enviro-Fact sheets from Share-Net ▪ E-Info CD from Share-Net **(1) Note:** Pack being analysed in this research.	A number of readings (papers and articles) focusing on: ▪ Principles for sustainable living ▪ Green development ▪ State of the World ▪ Grassroots movement ▪ Poisoning, hybrids and genetic modified organisms **Some additional materials** ▪ **Wild about pack biodiversity pack (1)** ▪ *State of the Environment for Schools* booklet **(1) Note:** Pack being analysed in this research.

Learning support materials (presented in the resource packs)	
▪ Examples of information on environmental auditing from the NEEP ▪ Fact sheet on environmental auditing ▪ Examples of audit sheets and questionnaires ▪ Example of an environmental audit report ▪ Other NEEP materials Note: All the above are existing materials and were not developed specifically for this assignment.	▪ Introduction to the pack (developed for this activity) ▪ Introduction to biodiversity ▪ Windows on the Wild poster ▪ Other materials related to biodiversity and the HIPPO dilemma Note: All the above are existing materials and were not developed specifically for this assignment (unless indicated otherwise).
Guidelines for assignments (Assignment Task)	
Environment and environmental issues **Focus on the following outcomes:** ▪ Demonstrate an understanding of the complex nature of environmental issues ▪ Conduct an **environmental audit** to identify **environmental issues** in a local context of your choice ▪ Demonstrate knowledge and skills linked to the other outcomes (see overall outcomes) **Specific guidelines** **Part 1: Planning and conducting an Enviro Audit** Use the *Enviro Audit Resource Pack* to plan Conduct Audit with a group of learners ▪ Decide on a **purpose** for your audit ▪ Decide on **who will conduct** the audit with you – who are the **group of learners**? ▪ You should **design** an audit sheet or questionnaire for the use in the audit ▪ The audit should be conducted in a **local context** of your choice ▪ You should prepare an audit report outlining the **process and outcomes** of the audit ▪ You should also provide **evidence** of the audit process **Part 2: Finding Environmental Information** Find other sources of up-to-date information Focus on a local environmental issue/s ▪ Describe how you might use these information sources with the group of learners who were involved in the audit **Presentation of the Assignment** 1. In a form of a report which should include: a. Relevance of the audit for learners' context b. Purpose of the audit c. Description of the learner group d. Examples of materials developed and used e. Description of the audit process	Contemporary environmental issues: Biodiversity study **Focus on the following outcomes:** ▪ Demonstrate a critical understanding of the forces driving specific environmental issues within the SADC region ▪ Develop an **educational pack** for supporting learners in exploring and responding to local **biodiversity issues** ▪ Demonstrate learning (and overall outcomes) **Specific guidelines** ▪ Develop a "Special species WOW pack" for the study of **a plant or animal that is rare or endangered** in a particular context (e.g. your local area, a coastal environment, a lake or mountainous environment) and whose disappearance is of concern to you and other (e.g. your community, scientists, etc). **Non prescriptive guidance, allowing participants to identify a particular animal or plant relevant to their work context.** ▪ Participants are expected to critique the educational process undertaken when using the pack with a group of learners Use the *Wild about Biodiversity Pack* to: ▪ Decide on how landscape or biodiversity changes have come about Find other sources of up-to-date information in the Enviro Facts series or at the Resource Room (in Rhodes University Environmental Education Unit) **Presentation of the Assignment** 1. In a form of a Biodiversity Pack which should include: a. Information about an endangered or rare animal or plant b. Learning support materials or ideas to support local investigation c. Learning support materials or ideas to support

f. Evidence of learners' participation 2. Identify sources of information which include: a. Good quality and up-to-date sources b. Clear references of these sources c. Description on how to use these sources	action projects d. Detailed activity plan on how these materials would be used with a group of learners. 2. Report on the use of the pack which should include: a. Problems and successes with the pack b. Evidence of learners' work
Other notes or observations	
Page 2: "You will be using some or all of these learning support materials in learning-centred activities as part of your assignment task. We call this **resource-based learning** [emphasis on original]". Page 3: "You could adapt them [Enviro Fact Sheets] and select text from them on computer to develop new materials for use with groups of learners". Page 4: Participants were asked to use Enviro Fact Sheets and other materials "to compile a new information sheet on a particular issue". Page 4: An applied focus means to undertake an activity (environmental audit) with a group of learners. Page 5: Note that "your info sheet should be a NEW, CONTEXTUALLY RELEVANT [emphasis on original] info sheet", thus learners need to undertake some research.	Page 2: "For an on course task, you will be asked to compile a State of Environment (SoE) report focussing on the pressing issues in Grahamstown …". Page 6: "For your home assignment you will be asked to consider a species under threat in your local area and to develop a biodiversity pack for studying this issue with a group of learners". Page 6: "The HIPPO [**H**abitat loss; **I**ntroduced species; **P**ollution; **P**opulation and **O**ver-consumption] Dilemma is simply a tool for considering these issues … a tool for analysing how landscape change and biodiversity loss has come about in your area". Page 6: "What is important is to understand the history and context of the issues, and the local, national and international arena".
Assignment Task 1. No reference to critical reflection or self-evaluation is mentioned. 2. Description of activities and process is encouraged but again no clear reference is made on the decisions made (how and why). It is later mentioned (see point 6). 3. Participants are encouraged to read relevant materials as well as to look at the learning support materials available in the resource pack. 4. Attention is given to **purpose** and **context**. Participants are encouraged to develop their own materials (audit sheet or questionnaire). These materials counted for marks. 5. Clear step by step guidelines are provided. 6. Great emphasis is later given on the audit process, including how participants decided on purpose, a critical review of the audit process and a reflection on how participants would change/improve their audit. This is evident in the possible exam questions. 7. The development of materials (audit sheet,	**Assignment Task** 1. Participants are encouraged to use the WOW pack to develop their own *Wild about Biodiversity Pack*. 2. Participants are encouraged to include in their pack any other materials relevant to their study. 3. Participants are encouraged to draw on the Enviro Fact Sheets. 4. Participants are encouraged to use other sources of information. 5. Participants are encouraged to use the information gathered by themselves and by the learners during the study. 6. The development of materials (biodiversity pack) is seen as the whole assignment.

questionnaire) is seen as a part of the assignment.	
Assessment Criteria	
The content of the assignment ▪ Discussion on environmental auditing and its relevance to own particular context ▪ Ability to define a clear purpose statement for the audit ▪ Description of learner group ▪ Quality of audit sheet or questionnaire ▪ Relevance of the audit sheet or questionnaire to context and learners group ▪ Evidence of ability to plan environmental audit ▪ Evidence of ability to interpret audit findings ▪ Evidence of learner participation in audit ▪ Evidence of ability to report on audit process and audit findings ▪ Evidence of ability to find good quality information on relevant issue (associated with audit results) ▪ Insights into how information might be used with learner group	**The content of the assignment** ▪ WoW pack contains appropriate information about chosen species ▪ WoW pack contains appropriate learning support materials and/or ideas to support a local investigation into the reason for threats to species ▪ WoW pack contains appropriate learning support materials or ideas to support action projects to prevent further loss of the species and to reverse the trend ▪ Relevance of the selected learner support materials to context and learners group ▪ Relevance of proposed activities for making use of learning support materials ▪ Evidence provided which illustrates how learners (or the educator) engaged with the learning support materials and activities ▪ Critical consideration of the value of the biodiversity study as an educational process

Appendix 6 - Analytic Memo 2 (Participants' Experience 1) **Abbreviation:** AM2

Background

Detailing the categories emerged from the data generated from focus group interviews (FGP1-3; FGT; FGD) and semi-structured interviews (INT1-3) in relation to the participants' experience in undertaking two assignments of the ACEE, namely on an environmental audit (Module 1) and biodiversity pack (Module 3).

Table AM2 – Categories of Participants' Experience of Assignment Work

Categories	Summary of Comments	Data Sources
Focus on Context	▪ Strong focus on context and local issues ▪ Identification of topic (issue/species) and identification of learner groups ▪ Research (Finding out from other sources, e.g. interview people, visit places and read materials)	FGP1; FGP2; FGP3; FGT; FGD; INT1; INT2; INT3 FGP1; FGP2; FGP3; INT1; INT2; INT3 FGP1; FGP2; FGP3; INT1; INT2; INT3 FGP1; FGP2; FGP3; INT1; INT2; INT3
Adaptive use of Learning Support Materials	▪ Resource pack provide background information, guidelines, examples and steering ideas ▪ Materials adapted and/or developed to suit local context (language and learner groups) ▪ Using materials with learners in context	FGP1; FGP2; FGP3; FGT; FGD; INT1; INT2; INT3; FGP1; FGP2; FGP3; FGT; INT1; INT2; INT3 FGP1; FGP2; FGP3; INT1; INT2; INT3
Narration of Practice	▪ Descriptive report of the assignment process ▪ Evidence of critical reflection/applied competence	FGP1; FGP2; FGP3; INT1; INT2; INT3 FGP2; FGP3; INT1; INT2
Assignment Support	▪ On-course tasks ▪ Tutor support and comments ▪ Support from colleagues and people working on the field ▪ Workplace context/materials	FGP2; FGP3; FGT; INT1 FGP2; FGP3; FGT; INT1 FGP1; FGP2; FGP3; INT3 FGP1; FGP2; FGP3; INT2; INT3

Abbreviations for the data sources:

FGP – Focus Group Interview with Course Participants

FGT – Focus Group Interview with Course Tutors

FGD – Focus Group Interview with Course Developers

INT – Semi-structured Interview with Course Participants

Appendix 7 - Analytic Memo 3 (Participants' Experience 2) **Abbreviation:** AM3

Background

Detailing the categories emerged from the data generated from course documents such as Modules (MOD1 and MOD3) and Assignments (ASS) in relation to the participants' experience in undertaking two assignments of the ACEE, namely on an environmental audit (Module 1) and biodiversity pack (Module 3).

Table AM3 – Categories of Participants' Experience of Assignment Work

Categories	Summary of Comments	Data Sources
Focus on Context	▪ Strong focus on context and local issues ▪ Identification of topic (issue/species) and identification of learner groups ▪ Research (Finding out from other sources, e.g. interview people, visit places and read materials)	ASS.J1/2; ASS.Z1/2; ASS.A1/2; MOD1/3 ASS.J1/2; ASS.Z1/2; ASS.A1/2; MOD1/3 ASS.J1/2; ASS.Z1/2; ASS.A1/2; MOD1/3
Adaptive use of Learning Support Materials	▪ Resource pack provide background information, guidelines, examples and steering ideas ▪ Materials adapted and/or developed to suit local context (language and learner groups) ▪ Using materials with learners in context	ASS.J2; MOD1; MOD3 ASS.J1/2; ASS.Z1/2; ASS.A1/2; MOD1/3 ASS.J1/2; ASS.Z1/2; ASS.A1/2; MOD1/3
Narration of Practice	▪ Background information on topic/issue ▪ Purpose of audit/pack ▪ Sample of materials and evidence of work ▪ Descriptive report of the assignment process (activities and results) ▪ Interpreting findings ▪ Evidence of critical reflection/applied competence ▪ Links to readings and course materials ▪ General recommendations	ASS.J1/2; ASS.Z1/2; ASS.A1/2; MOD1/3 ASS.J1/2; ASS.Z1 ASS.J1/2; ASS.Z1/2; ASS.A1/2; MOD1/3 ASS.J1/2; ASS.Z1/2; ASS.A1/2; MOD1/3 ASS.J1 ASS.J1/2; ASS.A1/2 ASS.J1/2; ASS.Z1/2; ASS.A1/2; MOD1/3 ASS.J1/2;
Assignment Support	▪ On-course tasks ▪ Tutor support and comments ▪ Support from colleagues and people working on the field ▪ Workplace context/materials	ASS.J2; ASS.Z2; ASS.A1/2; MOD1; MOD3 MOD1; MOD3 ASS.J1/2; ASS.Z1 ASS.Z1/2; MOD1; MOD3

Abbreviations for the data sources:

ASS – Participants' Assignments (ASS.J – Joan; ASS.Z – Zola; ASS.A – Abel)

MOD – Course Modules (MOD1 – Module 1; MOD3 – Module 3)

Appendix 8 - Analytic Memo 4 (Course Design and Course Implementation) **Abbreviation:** AM4

Background

Detailing the categories emerged from the data generated from course documents such as Modules (MOD1 and MOD3) and focus group interviews (FGT; FGD) in relation to the ACEE course design and course implementation to enable resource-based learning in two modules (Module 1 and Module 3).

Table AM4 – Categories of Course Design and Course Implementation

Categories	Summary of Comments	Data Sources
Course Orientation	▪ Specific Outcomes ▪ Introduction to topic with links to readings, packs and assignments ▪ Assignments and assessment ▪ Course activities (work together tasks and tutor support)	MOD1; MOD3 MOD1; MOD3 MOD1; MOD3; FGT MOD1; MOD3; FGT
Course Materials	▪ Orientation texts ▪ Readings (related to topic) ▪ Additional learning support materials ▪ Resource packs ▪ Guidelines for the examination	MOD1; MOD3; FGT MOD1; MOD3; FGT MOD1; MOD3; FGT; FGD MOD1; MOD3; FGT MOD1; MOD3
On-Course tasks and Activities	▪ Work together tasks ▪ Participants' context is used ▪ Workplace focus ▪ Tutor support	MOD1; MOD3; FGT MOD1; MOD3 MOD1; MOD3 MOD1; MOD3; FGT
Assignments and Work-away tasks	▪ Practical activity/Applied focus (focus on an issue, materials adapted/developed and used with learners in context) ▪ Undertake research ▪ Evidence of work required (photos, materials, learners' work) ▪ Assessment criteria provided ▪ Report on assignment process ▪ Workplace focus	MOD1; MOD3; FGT MOD1; MOD3 MOD1; MOD3 MOD1; MOD3; FGT MOD1; MOD3; FGT MOD1; MOD3; FGD

Abbreviations for the data sources:

FGT – Focus Group Interview with Course Tutors

FGD – Focus Group Interview with Course Developers

MOD – Course Modules (MOD1 – Module 1; MOD3 – Module 3)

Appendix 9 - Analytic Statement (Characterising Features of RBL) **Abbreviation:** AS

Background

This Analytic Statement was developed to identify the relationships between course design and course implementation, and participants' experiences of assignment work. This enabled the development of the characterising features of a resource-based learning approach evident in the ACEE.

Table AS – Characterising features of resource-based learning

Statement 1 – Deliberating contextualising focus	**Sections/**Sources
Resource-based learning in the ACEE considers the need to deliberate options for the contextualising focus of course participants' assignments as well as the relevance of their assignment work in informing their own practice. It recognises the need to develop contextually relevant learning support materials and to encourage assignments and work-away tasks focusing on local issues which are relevant to participants' context. Participants are encouraged to work with, and involve, local learner groups in their assignment work.	
Course design: Course participants are requested to work on environmental issues manifested in their local context and to develop contextually relevant materials to respond to local environmental issues. Course materials, guidelines and assignment support provided, emphasise the importance of context and relevance. The need to work with local learner groups is also emphasised.	**4.4.1.; 4.4.4.; 4.5.2.; 4.5.3.** MOD1; MOD3; AM4; CT
Assignment work: Course participants deliberated ideas for their assignments with course tutors, colleagues and peers. They also considered their work context when undertaking their assignment work and work-away tasks. Participants identified local environmental issues and biodiversity species which were relevant to their work. In doing this, participants were able to understand better they local environment. This enabled them to improve/change the way they were doing their work. In undertaking their assignment work, they worked with diverse local learner groups.	**4.4.1.; 4.4.2.; 4.4.4.** AM2; AM3
Statement 2 – Resource packs	
Resource packs are an important component of resource-based learning in the ACEE. They provide background information, guidelines, examples of materials and steering ideas for the development and adaptation of materials. Resource packs are important to engage participants in the adaptive use of learning support materials in diverse contexts.	
Course design: The resource packs are developed as tools to support course participants in the development and adaptation of learning support materials. These materials are to be used in diverse contexts. In the resource packs, diverse examples of materials are included to enable participants to select and adapt the more appropriate ones. These packs are influential in participants' assignment work. The resource packs are linked to each module.	**4.4.2.; 4.5.2** FGT; FGD; MOD1; MOD3
Assignment work: Participants drew substantially on the resource packs for their assignment work. The resource packs were useful as a starting point to generate ideas and to open up possibilities for materials development and adaptation. The resource pack also encouraged the use of other learning support materials as well as the need for contextual research.	**4.4.1.; 4.4.2.** AM2; AM3

Statement 3 – Workplace-based assignments	
Workplace-based assignments are important in improving participants' practice and in encouraging them to get support from work colleagues. They encourage participants to draw on materials available at their work contexts and to grow professionally. In workplace-based assignments the work context also plays an important role as participants undertake their assignment work with a view to improve/change their practice.	
Course design: On-course tasks and activities are planned to scaffold participants' workplace-based assignments. The assignments are designed as a practical implementation of issues discussed in the course sessions and ideas presented in the course readings. These assignments are also designed to enable learners to apply in their work context what they learned in the course, and to make links between the course materials and their assignments.	**4.4.1.; 4.4.4.; 4.5.1.; 4.5.2.; 4.5.3.** FGT; MOD1; MOD3; AM4
Assignment work: Participants consulted work peers to clarify the purpose of their assignments. They drew on their workplace structure, facilities, colleagues and materials when undertaking their assignments. There is evidence of participants making the links between the course sessions and the assignments. Participants recognised that by focusing on their workplace they were able to improve their work and, in some cases, involve work colleagues.	**4.4.1.; 4.4.2.; 4.4.4.** AM2; AM3;
Statement 4 – Adaptive use of learning support materials	
Resource-based learning in the ACEE emphasises the need for participants to, based on a range of existing materials, select, adapt/develop and use materials with a group of learners in specific teaching and learning programmes in their work context. It also recognises that the use of materials in context with learner groups should inform the redevelopment of these materials.	
Course design: Resource packs and assignment guidelines are provided to encourage participants to engage in the adaptive use of learning support materials. The course sessions and work together tasks also provide scaffolding for the assignment work. The course orientation for adaptive use of learning support materials involves the selection of materials, development/adaptation and the use of materials in context.	**4.4.2.** AM2; AM3; AM4; CT
Assignment work: Course participants drew on existing materials (resource pack and others) to adapt or develop their own materials. In doing this they recognised the needs and context of the learners, and the relevance and appropriateness of the materials for their teaching and learning programmes. Participants used the materials they developed in learning programmes in their workplace with groups of learners. After this, they critically reflected on the use of their materials with a view to improving them.	**4.4.2.** AM1; AM2; AM3;
Statement 5 – Reflexive narration of practice	
The narration of practice in the Advanced Certificate in Environmental Education takes the form of descriptive reports of the assignment work as well as formal presentations and report back sessions during course contact sessions. In the ACEE, through a reflexive narration of their practice participants are expected to critically reflect on their actions and apply possible changes in other contexts. Evidence of applied competence is also required.	

Course design: Guidelines provided on the course modules request participants to prepare written reports of their assignment work and to include examples of learners' work and materials adapted/developed. The guidelines and on-course tasks encourage participants to make links between the course materials and their assignment work. Participants are encouraged to critically reflect on their practice.	**4.4.3.; 4.4.4.; 4.5.4.** MOD1; MOD3; AM4; CT
Assignment work: Course participants provided written and verbal reports of their assignment work. In these reports they narrated how the assignment work was undertaken and included examples of the activities they conducted. They also explain the reason why they have made certain decisions. In the narration of their practice, examples of applied competence as well as links with the course materials were evident.	**4.4.3.** AM2; AM3;
Statement 6 – Practice-based orientation	
Resource-based learning in the ACEE emphasises the practical nature of the course and its assignments with a view to put theory into practice. The practice-based orientation encourages the development of skills that promote lifelong learning as well as the development of applied competence. The practice-based orientation of the ACEE requires participants to apply their learning in their context and to question the way they do things in a certain ways.	
Course design: Assignments are seen as a practical implementation of issues discussed in the course sessions. The assignments are designed to enable participants to apply to the context of their work what they learned in the course. A focus on applied competence is emphasised throughout the course. A number of activities are designed to encourage the development of diverse skills and roles.	**4.4.4.; 4.5.1.; 4.5.3.; 4.5.4.** FGD; FGT; AM4; CT
Assignment work: When undertaking their assignment work and on-course tasks, participants were engaged in fieldwork and research activities. These activities were undertaken with the view to improve or change their educational practice. Links between theoretical ideas evident in the course were applied in practical activities participants undertook, notably in the assignments. Participants were also able to engage in understanding learning processes rather than just practical skills. In doing this, they were engaged in a number of different roles.	**4.4.1.; 4.4.2.; 4.4.3.** AM2; AM3; FGT