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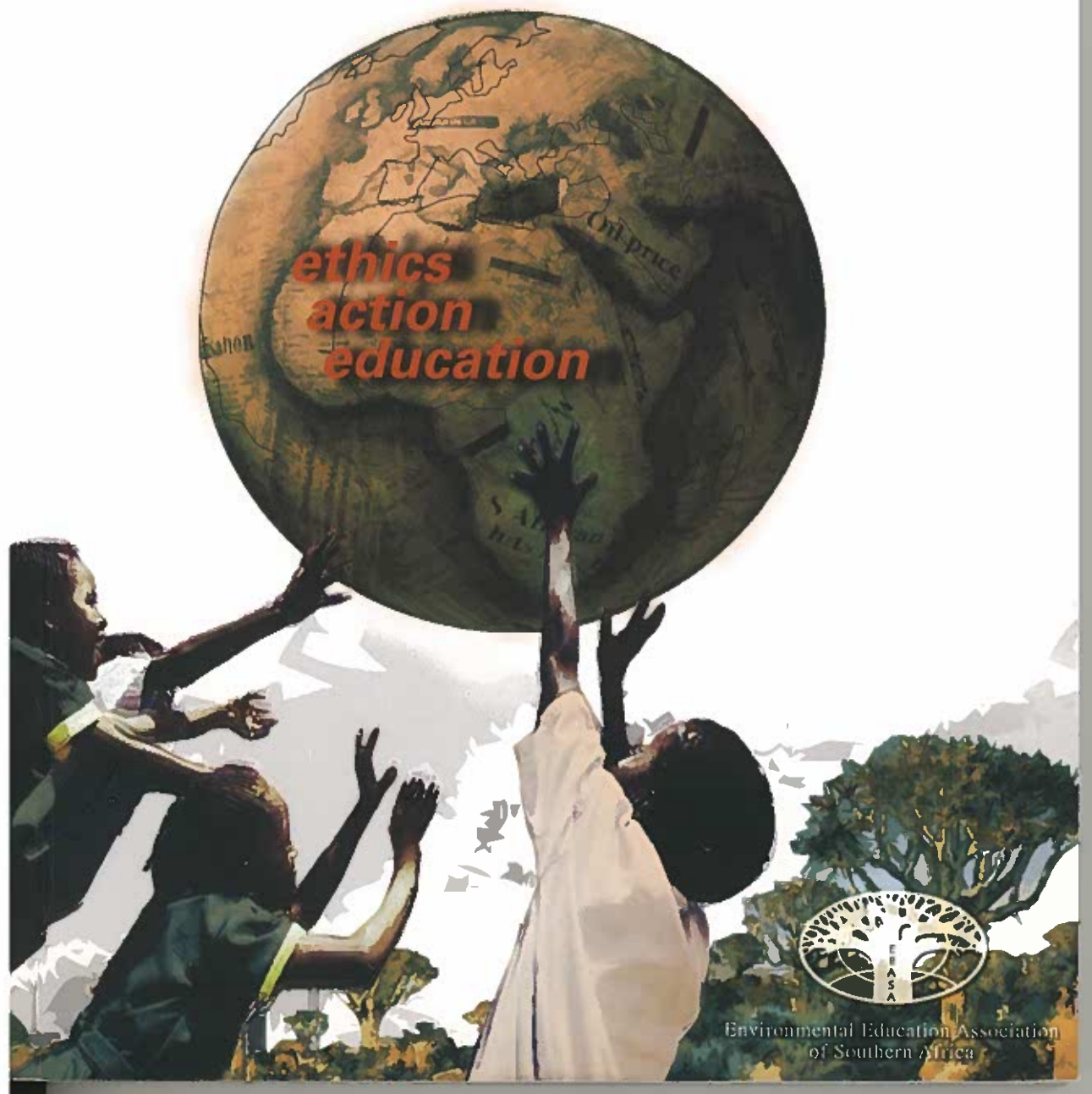

Environmental Education Association of Southern Africa

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Education Quality on the Agenda

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The SAJEE aims to publish and report on a wide range of aspects relating to Environmental Education, Ethics and Action in southern Africa and elsewhere. The journal seeks to further the study and practice of environmental education by providing a forum for researchers, scholars, practitioners and policy makers. The journal aims to carry papers reflecting the diversity of environmental education practice in southern Africa, and includes conference reviews and keynote papers, retrospective analyses of activities or trends in a particular field, commentaries on policy issues, comparative aspects of an environmental education, environmental ethics or environmental action issue, and critical reviews of environmental education, ethics and action in a particular country or context.

The Southern African Journal of Environmental Education aims to provide southern African and other authors with a forum for debate, and professional development. The journal incorporates an author support programme to encourage new authors in the field to establish themselves as professional writers.

Papers published in the Feature Article section of the journal are reviewed by two and at times three advisory editors. Keynote, Viewpoint and Think Piece papers are reviewed by one of the editors of the journal or an advisory editor.

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Editorial
Environmental Education and Educational Quality and Relevance: Opening the debate

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This edition of the Southern African Journal of Environmental Education (SAJEE) tackles a critical issue being debated across the world today, namely the question of educational quality and relevance. In 2005 the UNESCO Education for All Global Monitoring Report entitled *Education for All: The Quality Imperative* (UNESCO, 2004) was published. This global monitoring report drew attention to issues of educational quality, and raised the problem that physical access to education does not necessarily lead to epistemological access to knowledge or to relevant education being offered to learners. In the foreword to the 430-page assessment of educational quality issues, Koïchiro Matsuura, Director General of UNESCO, stated that 'although much debate surrounds attempts to define educational quality, solid common ground exists … Quality must be seen in light of how societies define the purpose of education' (UNESCO, 2004: Foreword). He went on to explain that there seem to be two mutually agreed upon purposes for education in the world today: cognitive development of learners, and creative and emotional growth of learners to help them acquire values and attitudes for responsible citizenship. He also pointed out that 'quality must pass the test of equity' (UNESCO, 2004: Foreword), emphasising the importance of equity of opportunity to access and participate in education and learning. Relevant to the field of environmental education, is the inclusion of educational quality as a major thrust of the United Nations Decade of Education for Sustainable Development (UNDESD) (UNESCO, 2004).

While most of us would agree that improved educational quality is desirable, there is little discussion in the environmental education community as to what this actually means, and *how* environmental education may be seen to be improving educational quality, since we seem to by and large (somewhat uncritically) simply assume that what we do *will* improve educational quality and relevance. Early agreements such as the Tbilisi Declaration on Environmental Education, emerging out of the 1st International Conference on Environmental Education (UNESCO-UNEP, 1978) indicated the need for holistic, integrated and inter-disciplinary approaches to environmental education, and the development of critical and problem solving skills as key 'features' of environmental education which would (it was assumed) contribute to educational quality. The NGO Forum Principles on Environmental Education (developed alongside Chapter 36 of Agenda 21) at the Rio Earth Summit in 1992 had similar yet different principles for environmental education which were more strongly oriented towards social transformation. This set of principles emphasised critical and innovative thinking, individual and collective learning, cultural interchange, systemic engagement with issues, indigenous knowledge, local culture and community participation. When considered in relation to

environmental education's possible contribution to educational quality, these principles paint a different picture to what was proposed by the Tbilisi Principles in 1977. As can be seen in the recommendations of the 4th International Conference of Environmental Education produced at the Ahmedabad Conference in India in November 2007 (30 years after Tbilisi, published in this edition of the EEASA Journal), this trend towards seeing environmental education as potentially focused on social transformation objectives continues. The Ahmedabad declaration and recommendations are far more focused and clear about influencing the *purpose* of education than were the other two sets of principles outlined above. They state that education needs to be oriented towards equitable and sustainable living, which requires a 'fundamentally different enlightenment' to the one established under modernity. The Ahmedabad Recommendations state:

> We no longer need recommendations for incremental change; we need recommendations that help to radically alter our economic and production systems, and ways of living. We need an educational framework that not only follows such radical changes, but can take the lead. This requires a paradigm shift. The roots of our present education paradigm the world-over can be traced to the Enlightenment era, which gave birth to science as we know it today and influenced all areas of human thought, activity and institutions. This Enlightenment paradigm is based on the ideas that progress is rooted in science and reason, and that science and reason can unravel the mysteries of nature. It encourages us to 'know' nature in order to use, transform and consume it for our insatiable needs … Today, we need a new Enlightenment to redefine our notion of progress. Since we have rapidly exhausted or polluted nature in pursuit of such progress, this new paradigm needs to recognise that we must live within the limits of nature's systems and that that we need to 'know' nature in order to transform societies to live sustainably in happiness, peace and with dignity, amongst themselves, and in relation to Planet Earth. (This edition, pp.201–202)

If we consider this statement from the 4th International Environmental Education Conference (along with the range of historical conference outputs, policies and international implementation schemes, etc. that have emerged since 1997 to guide educational re-orientations towards sustainability), in relation to Matsuura's statement above about quality being defined in the light of how societies define the purpose of education, it is possible to see that environmental education has a critical role to play in not only *contributing to* educational quality (i.e. improving the practice and efficacy of educational interventions), but also in *re-defining* educational quality. A question we could consider here is: If educational systems are developing learners' cognitive skills, and their values and attitudes in such a way that these are not contributing to a wider re-orientation of society towards equity and sustainability, would such education be considered *quality education?* With this in mind we could ask Koïchiro Matsuura, UNESCO and others concerned with educational quality whether quality should not also pass the test of future socio-ecological resilience and sustainability. My reading of the Ahmedabad Declaration and Recommendations (this edition), and other similar documents being produced in society such

as the Statement by the 1st International Mainstreaming Environment and Sustainability in African (MESA) Universities Partnership Conference held in Nairobi in November 2008 (this edition) is that it may be time that we, in our discussions on educational quality at the start of the 21st century clearly state that: 'An education system that does not take full account of the critical threats to future socio-ecological resilience and sustainability is not fulfilling its mission.' The authors in this journal all have various contributions to make to this discussion.

In 2007 the SADC Regional Environmental Education Programme, sister organisation to EEASA, commissioned a research project to explore the relationship between environmental education and educational quality, involving five universities in southern Africa (Rhodes University, the University of Zambia, the University of Zimbabwe, the University of Botswana and the Mauritius Institute of Education). A number of the papers in this edition emerge out of the research undertaken to address this question, and the wider question on educational quality, educational purpose and educational transformation raised above. The papers from authors working in this research network included in this journal (see papers by Hogan, Namafe, Shumba *et al.*, Nsubuga, Ketlhoilwe & Maila) are joined by others, also concerned with different facets and dynamics of the broader questions of educational quality, relevance and re-orientation. Each of the papers raise interesting questions related to issues of how environmental education might contribute to and/or help to redefine educational quality questions in a southern African context.

The journal opens with a paper by Moraig Peden who argues that education for sustainable development (ESD), through its interest in integrated knowledge devalues a knowledge base, particularly in relation to the natural environment. Drawing on a social realist view of knowledge, she argues for a way out of the traditionalism of 'content-based' education, and the progressivism of ESD, by proposing a disciplinary knowledge base to underpin environmental education. This she regards as being 'foundational' in teacher education and schooling, and suggests some ways of addressing what she sees as a critical problem with contemporary interpretations of ESD which appear to be relativist. Her paper forms part of a wider discussion in educational sociology on the nature and role of knowledge in education, which is in the process of rejecting social constructivist, relativist models of curriculum (Moore & Muller, 1999;Young, 2008) which became popular in democratisation processes that sought to oppose oppressive knowledge regimes of the past. Such social realist arguments are aiming to 'reclaim' knowledge as being foundational to education, while recognising that knowledge is emergent and ever-changing. Social realists argue therefore that it is not tenable to relegate knowledge defining in education to 'voice discourses'. Here we can read that the voices of communities alone are not adequate for defining educational knowledge. Moore and Muller (1999) state that giving too much attention to 'voice discourses' only serves to assert the power of some groups to claim that their *experiences* should count as *knowledge.* Moraig Peden's paper and its antecedent arguments therefore provides a useful opening paper, to be read in relation to all of the other papers in this edition of the EEASA Journal.

Eureta Rosenberg's paper deliberates the possibilities and problems of the Eco-Schools programme in South Africa, drawing on the findings of a recent evaluation of the programme. She reflects on the 'swathe' of policies that have been adopted in South Africa since 1994, and

on some of the complex and historically rooted implementation failures surrounding these policies. In particular, she provides a useful overview of some of the more recent findings related to quality failures in the South African education system, and proposes that this backdrop of quality failures is a significant influencing factor for the Eco-Schools programme. Through an evaluative analysis of the Eco-Schools programme activities and portfolio's she points out that the current practices of educational support projects such as Eco-Schools can further exacerbate the 'quality crisis' if they fail to adopt a reflexive approach in relation to the contextual quality crisis issues. Through the paper, she argues that programmes such as Eco-Schools ought to consider issues associated with educational quality in their conceptualisation and implementation, and proposes that Eco-Schools has multiple possibilities to contribute to educational quality improvements in South African schools since it addresses issues of poverty and learner motivation, whole school management and planning, it provides resources to support teaching and learning, and it enhances teacher motivation and teacher competence, as well as curriculum management and delivery. This paper provides a wide view of educational quality issues confronting schools and environmental education programmes, with interesting empirical observations.

The papers by Rose Hogan (from Tanzania), Charles Namafe (from Zambia) and Overson Shumba and his colleagues Raviro Kasembe, Cecilia Mukundu and Consolata Muzenda (from Zimbabwe) all tackle the problem of quality differently to the way that Moraig Peden and Eureta Rosenberg do. These authors, writing and researching in their respective countries (Tanzania, Zambia and Zimbabwe) seek out how an engagement with the voices and strengths of communities, learners and local knowledge resources can help to address questions of educational quality through *contextualisation* of learning in spaces and discourses that are relevant to and valued by communities. Perhaps this is because they were all working together in the SADC REEP research programme which sought to probe how environmental education could contribute to educational quality and *relevance*. Embedded within this framing is an assumption that relevance (or the voice discourses that Moore and Muller refer to) *do* matter in education and learning, and that there is significant value in mobilising these voices in relation to educational processes and practices and more widely available knowledge. Hogan's paper seeks out a *pedagogical approach* to enhancing epistemological access (to the formal curriculum) through participation and contextualisation of knowledge and learning. Her argument is that such pedagogical processes have intrinsic value since they affirm learners' and community experience, culture and knowledge, enabling *meaningful connections* to be made between the academic and social life of the students. Drawing on the work of Basil Bernstein, she argues that 'an over-rigid curriculum [such as the Tanzanian curriculum] is a constraint to contextualisation, and presents a challenge to environmental educators'. Her paper, when read against the Peden argument, raises an interesting question for arguments that favour the reclaiming of 'foundationist' forms of knowledge, since like others before her, she argues that while wider knowledge exists in society (as Muller and Moore argue), it is the *selection* and *representation* of this knowledge which is problematic, since schools in Tanzania seem to be presented with a 'one-sided' knowledge experience through the formal curriculum. Her paper therefore provides a subtle challenge to Peden's paper, but cannot be relegated to the relativist

camp, so to speak, since she also presents a (subtle and differently framed) interpretation of social realist views of knowledge. It presents an interesting paper for those involved in Eco-Schools research programmes too.

The paper by Charles Namafe is interesting from two points of view – it challenges orientations to environmental education research that are 'risk' and 'problem' centred, and seeks out an agency-centred/strengths model for considering the question of educational quality and relevance. Namafe presents a framework for early research to examine this question, and proposes that participatory, service-learning orientations to research in universities may also be needed to fully develop such insights into educational quality and relevance. The future outcomes of the research and some methodological critiques will no doubt provide further insight into the actual contributions of this orientation to enhancing educational quality and relevance. For now the methodological thinking is an interesting opening for possible ways of reframing thinking about educational quality more broadly.

Overson Shumba and his colleagues in Zimbabwe develop a 'voice discourse' for communities living in poverty, within an action research framework that shares assumptions of the service learning research role outlined in the Namafe paper (a view also shared by Hogan). Their paper shows clearly what the link is between quality of education and quality of life and how a decline in opportunities for enhancing livelihoods has affected educational quality in a Zimbabwean resettlement community. Through participatory research and pro-active engagement with communities in the research process, some changes were realised that had potential to improve quality of education. Thus, like Eureta Rosenberg, Rose Hogan, and Charles Namafe, their argument is supportive of an approach that *contributes to* quality improvements through a better understanding of the *status quo* and existant conditions and challenges in schools and school communities. Research and researchers, in this context, have a real and material contribution to make. Significant in the Shumba *et al.* paper are the insights into *collective agency* as a critical factor in enhancing educational quality. This decentres the discussion on educational quality from being knowledge centred (as in the Peden paper), towards a holistic, community-integrated orientation to educational quality.

The paper by Yvonne Nsubuga refocuses our attention on questions of knowledge and quality. She investigates the way in which natural-resource management knowledge is integrated into the Grade 10 Life Sciences curriculum in South Africa. With careful empirical and analytical tools, designed from Bernstein's sociological concepts of the pedagogic device, classification and recontextualisation, she shows how breakdowns between different pedagogical fields occur. Her research shows that the National Curriculum Statement has included high levels of natural-resource management knowledge and that this is strongly represented in official pedagogic discourse, but that this is not translated into the practice of teachers. Her research draws attention to the need to not only consider educational quality from a knowledge perspective (i.e. what knowledge is respresented), but also how this knowledge is translated and contextualised (or not). The contribution of this paper is also methodological, in that it shows the need for developing carefully thought through tools for analysis of educational quality issues that are theoretically informed and empirically rigorous.

Following the cluster of papers discussed above, which all essentially deal with educational quality issues in schools and school communities, a second cluster of papers is included in the journal, this time dealing with questions of how environment and sustainability education should be integrated, conceptualised and included in higher education curricula and teaching programmes.

The paper by Justin Lupele explains that unless one takes account of the underlying causal mechanisms affecting environmental education course development activities in higher education, such initiatives might not be effectively institutionalised. This research draws attention to the structural dynamics of initiatives aimed at improving educational quality and relevance in institutions. Drawing on a similar critical realist theoretical framework, Muchaiteyi Togo deliberates how one might identify and assess the incorporation of environment and sustainability knowledge and pedagogies in university departments. Her research highlights interesting dynamics at play between existant knowledge disciplines (reflecting the social realist view that knowledge exists already), and constructivist processes of introducing new knowledge into education systems (evident in the introduction of ESD, as also discussed by Peden). Her research shows that not all disciplines are equally responsive to integrating new knowledge or new trends, and that this is sometimes related to the nature of the discipline itself, and other times to structural and agential factors. This research also points to the importance of understanding social realist views of knowledge, underlying structural and causal mechanisms, and emergence processes in thinking through environment and sustainability education contributions to education system change and improvement.

The paper by Ketlhoilwe and Maila considers educational quality and relevance in higher education curriculum development differently, in that they use a consultative research process to draw out stakeholder discourses to conceptualise what might count as educational quality and relevance in a new masters degree in Environmental and Sustainability Education in Botswana. Their reference point is the stakeholders who might benefit from the programme, not only the existant knowledge in the field. Their social realist view of knowledge, like that of Hogan, is 'wider than the books', so to speak, and considers *all* knowledge existing in society, not only that which is scientifically produced and represented in scientific texts (which is the most widely used form of knowledge represented in schools and universities).

Moore and Muller (1999) however, suggest that voice discourses (e.g. the discourses of the communities and stakeholders in the Ketlhoilwe and Maila paper), might just be experience dressed up as knowledge, and they argue that experience is an unreliable basis for deciding whether something is true. One can then extrapolate that experience on its own would be an unreliable basis for education and learning, hence Peden's argument for foundational knowledge and environmental literacy courses in teacher education programmes. For that reason, Ketlhoilwe and Maila's point that this might enhance existing knowledge and discourse on what might be a quality curriculum, is an important one, and their commitment to both local *and* global or wider discourses indicates that they share a social realist knowledge framework with Peden, although they are not as explicit about the form of activities that they would implement as Peden is. Michael Young (2008), one of the authors that Peden draws on to make her argument, argues for a form of epistemology which he calls *social realism*. He

claims that this addresses the educational dilemma of a curriculum being given in its entirety, or a curriculum based only on voice discourses and experience. He argues that social realist accounts of knowledge take the emergent properties of knowledge into account (i.e. how experience, context and such factors influence knowledge) *as well as* the wider social basis of knowledge (i.e. the longer term existence of knowledge, its disciplinary structure, etc.). Thus, through the Ketlhoilwe and Maila paper, we return to the opening question on educational quality provided by Peden.

The last research paper in the journal is a paper by Jan van Ongevalle and his colleagues Huib Huyse, Steff Deprez, Peter van Petegem and Iris Jane-Mary Chimbodza from the Zimbabwe Secondary Teacher Training Environmental Education Programme. Their concern is how evaluation and monitoring can enhance participation and therefore quality-relevant outcomes in an environmental education programme. They deliberate a new strategy for such evaluation work that they have been working with, namely Outcome Mapping. Like the Namafe paper, there is still more to learn from the start-up work that they report on in this methodological paper; particularly interesting might be how these methodologies contribute *to* enhanced quality of learning in environmental education.

The journal wraps up with two Viewpoint papers. The first is a short paper by Lesley le Grange, who discusses the nature of environmental justice as an environmental discourse. He draws on an earlier paper by Noel Gough who raised questions around educational 'quality' as an 'order word' (both Gough and Le Grange draw on Deleuze and Guittari (1994) to frame their arguments on 'order-words', which are words that are linked to social obligations with implicit presuppositions implicit in them). Gough (2007:97) argues that order words such as 'quality' have performative effects, and influence practice. We should therefore not ask 'what quality *means* but ask how it *works* and what it *does* or *produces* (or prevents) in specific locations'. Le Grange debates environmental justice in this way, as an 'order word' with performative effects. He sees it relevant to do so because environmental justice has been included in the South African National Curriculum Statement, which implies that it ought to become part of the discursive terrain of all subjects, influencing the purpose and outcomes of education. Although he does not explicitly state it, his discussion could potentially contribute to thinking about how educational quality comes to be defined through the concepts and 'order words' that are privileged in framing what education *ought to* promote (e.g. environmental justice). What is also interesting to do from the perspective of educational quality, is to examine Nsubunga's empirical findings on recontextualisation of policy in the light of Le Grange's claim that teachers 'analyse policies rhizomatically' (this edition), and Peden's view that there is a need for foundational environmental literacy in teacher education, and Hogan, Namafe and Shumba's arguments for contextualised forms of enabling educational quality. This makes for a rich terrain for debating the relationship between environmental education and educational quality, which is why this Editorial is titled 'Opening the debate', and why the sub-title of this journal is 'Educational Quality on the Agenda'.

The last Viewpoint paper is a short paper that I produced as an introductory note to the two sets of conference recommendations that are published in this edition of the journal. The paper deliberates the value and 'unstated purpose' of conference recommendations within

a broader trajectory of social change. It argues that such conference outcomes are useful for tracking changes in a field, and for 'marking out' the terrain for guiding transformative thinking and practice, and as such are critical tools for new social movements such as the environmental movement to understand their praxis within an historicised frame.

The two sets of conference recommendations that follow this short Viewpoint paper are: the conference declaration and recommendations from the 4th International Environmental Education Conference in Ahmedabad, India, produced in November 2007, and the Conference statement and recommendations from the 1st International Conference on Mainstreaming Environment and Sustainability in Africa Universities Partnership (MESA), produced in November 2008. These two sets of conference recommendations are published in the journal to enable environmental educators in southern Africa (and elsewhere) to review the field of environmental education in the light of new developments. As indicated in the opening paragraphs of this editorial, they are also useful for thinking through the question of how we should be contributing to and re-defining discussions on educational quality in a southern African context, and in Africa and the world more widely, at the start of the 21st century.

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Education for Sustainable Development: Knowledge and environment in South African schooling

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Abstract

The United Nations' launch of the Decade of Education for Sustainable Development in 2005 has focused international attention on the concept of education for sustainable development (ESD). This paper covers the emergence of ESD in relation to environmental education in South Africa. It critiques the core concept, sustainable development, and identifies a trend in ESD to de-value a knowledge base, particularly in relation to the natural environment. A sociology of knowledge perspective is used in conjunction with the writer's own experiences in environmental education. A critical/social realist approach is proposed as a way past the impasse of traditional education versus the progressivism of ESD. A disciplinary knowledge base is seen as foundational in teacher education and schooling in order to develop environmentally literate and responsible citizens. Strategies to achieve this include the introduction of a few selected environmental issues across the curriculum, making use of selected teachers rather than all teachers, and including core environmental literacy courses in teacher education.

Introduction

The United Nations Decade of Education for Sustainable Development (DESD), led by the United Nations Education, Scientific and Cultural Organisation (UNESCO), was launched in 2005 and encourages governments to implement education for sustainable development (ESD) in education systems and national development plans. The DESD aims to build the vision of sustainable development and promote the Millennium Development Goals. The four main target areas of the DESD are quality basic education, reorienting existing education, public awareness and training of both leaders and workers (UNESCO, 2005b).

South Africa is signatory to numerous international agreements on sustainable development and has a draft Framework for Action for the DESD (Olivier, pers. comm., June 2006). The current Minister of Education, Naledi Pandor, has committed her department to promoting the DESD and the principles of sustainable development in all levels of education (Segalwe, 2007).

The post-apartheid integrated curriculum has been described as radically constructivist (Taylor, 2000) and shows a strong affinity with ESD. It includes the principles of human rights, inclusivity, and environmental and social justice across all subjects, and does not address environment or sustainable development as subjects on their own.

This article explores the emergence of ESD from environmental education in South Africa and critiques it from a sociology of knowledge perspective. The critique is influenced by my own

disciplinary background in both natural science and development, upon which I draw substantially in my environmental education work with teachers at the University of KwaZulu-Natal.

I argue for a social realist approach as a way past the impasse of traditional education versus the progressivism of ESD. I propose a re-recognition of disciplinary knowledge in both natural and social sciences as a foundation for meaningful engagement with environmental issues.

The Problem of Sustainable Development

The concept of sustainable development emerged in 1987 from the UN World Commission on Environment and Development report, *Our Common Future*, produced in the wake of the UN Conference on the Human Environment in Stockholm in 1972. 'Sustainable development' entered global parlance after the 1992 UN Earth Summit (UNESCO, 2005b) as a way of linking human development needs to environmental issues (Le Roux, 2000).

Broadly, it includes the three pillars of development: environment, economy and society. However, by 1996 there were more than 300 published definitions of the concept (UNEP, 2006) and a crucial contradiction remains: the economic growth model of development and environmental health stand in fundamental opposition (Rees in Stevenson, 2006; De Gruchy, 2001) and insufficient global resources will prevent developing economies from following the same path as industrialised nations (Webster, 2004). While politicians have espoused sustainable development for 20 years, development paths have become less and less sustainable. The Millennium Ecosystem Assessment (2005), an extensive five-year international research report, reveals rapid ecosystem changes in ecosystems over the past 50 years with high extinction rates and severe pressure on ecosystem services such as fishing and fresh water supplies.

The natural environment has become increasingly remote in industrialised society, the concept of ecological limits is foreign (Scott in Stevenson, 2006) and danger signals are commonly misunderstood or disregarded (Smyth, 2006). But the poor often depend directly on natural ecosystems and there is a clear link between ecosystem health and human well-being (UNEP, 2006). In pre-industrial society, knowledge of natural resource use was an integral part of education and essential for survival.

For Robottom (2007:7) the concept of sustainable development does not challenge established practice but instead suggests 'a continuation of what we value'. This view is echoed by Bolscho and Hauenschild (2006) who claim that environmental educators face opposition if they question the basic values of modern life; a tension that often leads to them merely verbalising problems or organising token environmental actions.

As sustainable development is taken up at political levels, the environment often falls out of the picture altogether. The concept is open to numerous interpretations and is largely dominated by a focus on economic rather than environmental sustainability (Robottom, 2007).

Education for Sustainable Development

While there are concerns that ESD is new in name only (Robottom, 2007), others argue that it represents a shift in emphasis away from the natural environment and onto the social, political

and economic environment (Stevenson, 2006). Reid and Scott (2006) describe the tension between environmental education and ESD as primarily a tension between social justice and environmental protection. However, the social facets of environmental education are not new and can be traced back to UNESCO documents and the Belgrade and Tbilisi reports on environmental education in the 1970s (Robottom, 2007; Stevenson, 2006).

In South Africa, the launch of the DESD in 2005 was preceded by a long history of environmental education. Prior to 1994, environmental education was largely the domain of environmental NGOs and universities, but since then the environment has been included in the formal school curriculum both in principle and as a theme to be included in all subjects.

In the 1990s environmental education shifted strongly into the socio-economic and political arenas (Le Roux, 2000), looking very similar to ESD with university courses and programmes adopting progressive, constructivist approaches and concentrating on the links between environmental and social issues (UNEP, 2006; Le Roux, 2000). Concerns did, however, emerge amongst some educators that a predominantly social emphasis was leading to the exclusion of the natural environment (Rosenberg, 2004).

The goals of ESD are intentionally unspecific. Broadly it aims to create responsible, environmentally literate and critically thinking citizens able to address environment and development issues as a matter of conflicting interests and different perspectives (UNEP, 2006; Sandell, Ohman & Ostman, 2005), but it avoids the use of clear, unambiguous educational goals (Sandell *et al.,* 2005). The pedagogy of ESD encompasses progressive constructivist education approaches: critical thinking, participation, contextualised learning, use of local materials, problem-solving, community engagement, action-oriented, socially critical and student-led (Sandell *et al.,* 2005; UNEP, 2006; UNESCO, 2005c).

Within ESD there is a reluctance to identify a knowledge base. Existing knowledge is described as 'static' and rejected in favour of adaptive forms of knowledge, which are intended to prepare learners to cope responsibly and democratically with a rapidly changing society and create new space for alternative living (Sandell *et al.*, 2005, UNESCO, 2001, Wals & Corcoran, 2006). Anything else is seen as unacceptably undemocratic.

The Question of Knowledge

The question of knowledge lies at the heart of current debate in South African education. Muller (2004:17) identifies the current educational trend of avoiding knowledge structure and in-depth immersion in disciplines as lying at 'the nub of … current pedagogical dilemmas'. This has implications for ESD.

In the following section, I describe two distinct approaches to knowledge. I then look at how this might guide ESD and environmental education.

The discipline-bound approach to knowledge encompasses Durkheim's sacred knowledge, Vygotsky's scientific knowledge, Bernstein's (1999) vertical knowledge and Muller's (2000) Mode 1 or insular knowledge, and forms the basis of traditional approaches to education. Durkheim's sacred knowledge is collective knowledge which the individual has little choice in accepting, and thus functions to maintain social solidarity. It parallels the model of abstract,

modern science and highlights the social origins of abstract thinking (Young, 2008). Key to Vygotsky's scientific knowledge is reflexivity, which is only acquired through mediation (e.g. schooling). Bernstein's (1999) concept of vertical knowledge, heavily based on physics, identifies the hierarchical, coherent, explicit structure of the sciences; while Muller's Mode 1 knowledge is characterised as academic, inward-looking and transmission-oriented.

Discipline knowledge emanates from the collective practice of theory and reflection within a scientific community, giving it the power to transcend its original context in society and history (Moore, 2004; Niinitluoto, 2000; Young 2008). Spurret's (2008:8) argument in favour of discipline knowledge suggests that because 'the actual universe is deeply alien to our default conception of the world' we need scientific knowledge, which is often counter-intuitive and depends on the social structures of disciplines for its production. To gain such knowledge one must be inducted into the practices of a discipline (Dempster, 2005), a process which results in specialists being able to work with high levels of complexity (Spurret, 2008).

Traditional education based on discipline knowledge is often criticised for its tendency to rely on a 'given' curriculum. It has been labelled slow, inefficient, elitist (due to inequalities of access) and out of touch with global society (Young, 2008).

A second, distinct category of knowledge is everyday knowledge or common sense; which encompasses Durkheim's profane and Bernstein's (1999) horizontal knowledge and focuses on the practical and immediate with an inability to move beyond the local context. Vygotsky characterises common sense as emerging through face-to-face contact with life, lacking a system of concepts and with no capacity for generalisation and abstraction (Young 2008). Muller (2000) extends this definition to Mode 2 knowledge, which is applied, collaborative, outward-looking, socially accountable, innovative and emancipatory – i.e. knowledge which engages with the problems of the world.

The flaws of traditional education have increasingly led policy-makers to favour constructivist, progressive curricula on the grounds that it is emancipatory and allows for greater participation of learners in society. Such curricula emphasise everyday, integrated knowledge as a way of bridging learners' own cultural knowledge with discipline knowledge (Young, 2008). This shift is reflected in the outcomes-based education which followed the South African apartheid curriculum as well as constructivist approaches in environmental education and ESD.

Young (2008) raises concerns that constructivist critiques of discipline knowledge are polarising, unable to recognise truths in other positions and misrepresent discipline knowledge as monolithic rather than contested, while offering no alternative theories of knowledge. Constructivists diminish discipline knowledge by giving it the same weight as everyday, localised knowledge; and view it suspiciously as a disguise for individual vested interests (Moore, 2004; Niinitluoto, 2000). The argument around 'interests' is a circular one, and revolves around whose experience should underpin the curriculum. It ignores the possibility of pedagogic or cognitive interests (as opposed to money, status and power) and reduces knowledge to the views and experiences of the knowers. This limits its ability to transcend experience and leads to curricula only offering different forms of localism. Oppressed communities are therefore denied knowledge that goes beyond their own experience (Young, 2008).

While the use of everyday knowledge appears to converge with the policy goals of social equity, Young (2008) argues that it is promoted on socio-political rather than pedagogical or epistemological grounds. Its value in achieving social change is controversial. Bernstein's (1971) observation that everyday knowledge leads to inferior education relegated to less able children who struggle with abstraction is borne out by recent research which shows middle-class learners move relatively easily between everyday knowledge and abstract concepts, while working-class learners need explicit guidance to move beyond the local and specific (Hoadley, 2005; Hugo, 2005). Taylor and Vinjevold's (1999) classroom observations indicate that an absence of content knowledge leaves learners bewildered and unlikely to develop a systematic understanding of ideas.

The pursuit of new knowledge is an important goal of ESD (Sandell *et al.,* 2005; UNESCO, 2001; Wals & Corcoran, 2006). Proponents argue that this should be achieved through discipline integration as a necessary step for addressing complex sustainability issues such as climate change and HIV/AIDS (UNESCO, 2005a). The ultimate goal is trans-disciplinarity, where new theoretical understandings are generated (UNEP, 2006). Bernstein's (1971:10, 1999) argument that deep knowledge is acquired through a traditional discipline-bound approach to education and only reveals its mysteries to a select few may seem unacceptably elitist within ESD. But his proposal that it is only through deep, abstracted knowledge freed from particular contexts that new realities are discovered suggests a permeable form of knowledge which is crucial to the vision of ESD. He states: '… only a few experience in their bones the notion that knowledge is permeable, that its orderings are provisional, that the dialectic of knowledge is closure and openness.'

Integration was a dominant principle in South Africa's first post-apartheid curriculum, but by 2000 the Review Committee of Curriculum 2005 found that it weakened conceptual progression and coherence (DoE, 2000). Mounting evidence shows that the dissolution of discipline boundaries can disadvantage learners (especially those from poor backgrounds) by denying them access to powerful knowledge systems (Dempster, 2005; Dowling, 1995; Hugo, 2005; Muller, 2004; Taylor, Muller & Vinjevold, 2003).

Integration does not treat all disciplines equally. ESD, like the South African curriculum, places greater emphasis on social sciences than natural sciences. Dempster (2005) raises concerns that the emphasis on social justice within Life Sciences undermines the essential concepts of the subject.

The Natural Environment

ESD de-emphasises the natural environment. A UNESCO (2001) document states that ESD should not be confused with environmental education and it is not primarily concerned with the environment. This is echoed in a UNESCO (2005c) document on teacher education for sustainability. While the UNESCO International Implementation Scheme proposes that ESD should 'encompass and go beyond environmental education' (Calder, 2005:5), Webster (2004:82) claims: 'Science-based teaching about Nature and how we should protect it, is not, by itself anything to do with ESD.' In Sandell *et al.*'s (2005) book on ESD, it is characterised

with no mention of the natural environment. The environment is overshadowed by socio-economic foci and it is debatable whether ESD will challenge the industrial/technological and anthropocentric worldview that is described by Orr (in Stevenson, 2006) as part of the hidden curriculum of schooling lying at the heart of environmental degradation.

Diminishing knowledge in the field of natural sciences is a concern for some environmental educators and scientists who fear that the shift away from the natural sciences inevitably leads to a shallow understanding of environmental issues. As Louv (2005:142) argues: 'The people who name the animals, or even know the names, are fast becoming extinct.' Eminent oceanographer, Paul Dayton (in Louv, 2005) links the environmental crisis to virtual disappearance of natural sciences in academia. On the other side of the debate, Barraza and Robottom (2005) raise concerns that natural scientists, lacking social science knowledge, are inadequately prepared to address environmental issues. Robottom (1991, 2005) argues that 'information critique' is more important than the acquisition of knowledge, and that 'blind faith' in science is inadequate for environmental educators. In this paper I shift the emphasis by proposing that social science alone is inadequate for addressing environmental issues and that deep knowledge from both natural and social sciences is a prerequisite for critical thinking. Without an understanding of the science of key environmental issues, one is doomed to superficial and inappropriate responses.

Empirical research in the UK on teachers and trainee teachers shows weak knowledge of the carbon cycle, solar energy and ozone (Summers, Kruger & Childs, 2001). Rosenberg (2004) also observes weak natural science knowledge of teachers in South Africa schools, leading to the exclusion of the natural environment from environmental education. My teaching experiences at the University of KwaZulu-Natal, suggest that students enrolled in environmental education courses have superficial knowledge of environmental issues such as global warming, air pollution and the ozone layer. (Peden 2004; Peden, 2005; Peden, 2006a; Peden, 2006b; Peden, 2007a; Peden, 2007b). Evidence from student research projects conducted in schools in Pietermaritzburg, South Africa, indicates that although environment is supposed to cut across the entire curriculum, it is rarely addressed by teachers other than those in Geography and Natural Science (Peden, 2006b). Within these disciplines there is a narrow scientific focus with little attention to the interface between the natural and social sciences.

A Way Forward: Social/Critical Realism

Young (2008) and Moore's (2004) arguments for social and critical realism offer a way past the polarisation between traditional and constructivist approaches.

Critical realism (Moore, 2004) – or an associated body of work termed social realism (Young, 2008) – accepts the existence of a reality independent of individual perspectives, but acknowledges that knowledge is socially created, a process that forms the basis for objectivity rather than a condition which makes objectivity impossible. This argument claims that by being less individualistic, disciplinary knowledge is less fallible than other forms of knowledge. Young's (2008) social realism marries Durkheim's social reality of knowledge (the curriculum) with

Vygotsky's process for transforming the world using both disciplinary and everyday knowledge (the pedagogy).

Social realism proposes a knowledge-based model of curriculum where knowledge is external to the learners, with clear boundaries between discipline knowledge and everyday knowledge. This curriculum uses knowledge to overcome the circumstances in which people find themselves (Young, 2008), by shifting away from both Bernstein's a-historical 'given' curricula as well as from constructivist reliance on learner-centredness, relevance and experience. Curriculum autonomy is separated from economic and political demands and increased participation is balanced with cognitive interests; the aim being to build specialist communities rather than achieve learning outcomes. This approach is a midway position that does not reject valuable discipline knowledge, but rather views the conscious selection and use of such knowledge as an essential basis for applied, emancipatory and collaborative work in the world.

Unlike Durkheim, Vygotsky views the two types of knowledge as distinct but interdependent categories with potential for learners to move from concrete perceptions to generalisations and abstractions. Muller (2000) also proposes a relational approach between the two forms of knowledge. Mode 2 knowledge (applied, collaborative, outward-looking, socially accountable, innovative and emancipatory) appears to be a key characteristic of ESD, but Muller (2000) and Young (2008) argue that the way to get there is by building on the foundations of Mode 1 (disciplinary) knowledge, particularly at undergraduate level, in order to develop critical thinking abilities. Both Muller (2000) and Spurret (2008) emphasise the importance of differentiating between the two types of knowledge, and recognising when one crosses the boundaries between disciplines, rather than trying to hybridise them.

Muller (2000) argues that effective Mode 2 knowledge is generated through the collaboration of researchers from different disciplines, leading to results not achievable by individual experts. Higher-order reconfiguring skills, an ability to work with complex models and to generalise skills to analogous situations, requires the development of skills in specific discourses first. 'Active learning … begins with disciplines, not with whimsical activities detached from core subject matter concepts' (Darling-Hammond in Muller 2000:52).

Bernstein's (1971) proposals for successful inter-disciplinary learning – which include consensus around an explicit integrating idea (e.g. sustainable development) and skilled teachers who enjoy ambiguity and can link the integrating idea to the knowledge base – may have useful implications for ESD.

Social Realism and ESD/Environmental Education in South Africa

Muller (2004) identifies teacher competence as the most important factor in education and argues for solid disciplinary training of teachers. Ideally those who teach ESD should be selected from graduates in natural sciences (e.g. biology and earth sciences) as well as social sciences (which may include human geography, environmental history and environmental sociology), rather than expecting all teachers to do ESD or environmental education.

While environment is not a school subject in the South African curriculum, the opportunity does exist to include dedicated environmental courses in teacher education programmes. As many student teachers, both post- and undergraduate, have poor environmental literacy (Peden 2004; Peden, 2005; Peden, 2006a; Peden, 2006b), it makes sense to develop core environmental knowledge through environmental literacy courses before undertaking environmental education, where the focus is on pedagogy at the expense of discipline knowledge (Peden 2006b; Peden, 2007b).

If environmental education starts early in teacher education, it allows interested students to pursue it further. Final-year education students at the University of KwaZulu-Natal indicated that a compulsory course in environmental education[1] (Peden, 2007) was an eye-opener and something they had not previously thought about. This is illustrated by their comments:

> *'I need to find ways to bring awareness to others as this is an almost forgotten territory ofl earning.'*
> *'I have learnt that it is not only the government who has to look after the environment.'*
> *'Some of us had no idea or were not realising how important the environment is to people.'*
> *'Recycling and environment conservation is the simplest thing someone can do, but people tend to ignore it. It affects the globe as a whole. People should take heed of it.'*

Environmental education is a cross-curricula principle, an approach favoured by ESD (Smyth, 2006). Concerns about this approach are the tendency for environment to fall off the curriculum, as it is not the primary focus of any teacher (Rosenberg, 2004), as well as issues of over-simplification resulting from educators trying to cope with complexity in environmental issues (Smyth in Stevenson, 2006).

Effective ESD may be achieved by selecting relatively few in-depth studies of environmental issues and choosing local issues that connect to student's lives (Stevenson, 2006). Teachers could explore the root causes and effects of environmental issues from the perspective of their own disciplines, and then move on to generate analogies between global issues and local contexts.

Using Bernstein's (1971) criteria for successful integrated teaching, and by way of example, I have selected global warming as an explicit integrating idea which can be linked by skilled teachers to their own discipline in order to teach environment meaningfully across the curriculum.

Natural Science teachers could link global warming to ecology and environmental degradation; Geography teachers to natural cycles, climate patterns and development; History teachers to the industrial revolution, capitalism and globalisation; Religious Studies and Life Orientation teachers to ethics, values and citizenship; and Technology teachers to energy technologies. Hugo (2005) argues additionally for the support of sequenced, content-rich textbooks which can induct learners into discipline knowledge through clear, explicit rules. The aim here is to use disciplinary knowledge to take students beyond their own limited experience in order to imagine new solutions and new possibilities. When learners have acquired discipline knowledge of the environment they will be more able to become critical thinkers and engage in contextualised, socially critical learning and problem-solving, as proposed by ESD.

Conclusion

ESD claims to offer something new for education internationally. It focuses on teaching learners to engage democratically with different perspectives; and consciously lacks definition around its core concept – sustainable development – and its knowledge base. It promotes progressive constructivist pedagogy, integration of disciplines and everyday knowledge over disciplinary knowledge. This pedagogical approach, which also underlies the South African National Curriculum Statement, is currently being challenged for not meeting the educational goals of social justice and denying learners access to powerful knowledge systems.

Additionally, ESD continues a trend in environmental education of de-emphasising the natural environment in favour of social issues. These trends have resulted in the diminished nature-based views of environmental education in South African schooling.

This paper argues for a critical or social realist approach as a way around the impasse of traditional positivist education versus progressive constructive education. From this position, disciplinary knowledge of both natural and social sciences is an essential foundation for further engagement with the applied, collaborative nature of environmental education.

Failing the introduction of environmental studies as a school subject, this paper proposes strengthening school environmental education by selecting a few environmental topics to be addressed in depth in selected school subjects. Currently the Curriculum Statements at General Education and Training (GET) level (compulsory learning areas from grades R to 9) lack a specific and coherent focus on key environmental issues of the 21st century; such as global warming, climate change, habitat destruction and extinction, and the proximate causes such as consumption and population growth. While aspects of these topics are included in learning areas such as Natural Science and Geography, they are not addressed in a coherent, structured and critical manner. An explicit environmental focus within disciplines could be a starting point for powerful, integrated knowledge where both teachers and learners deepen their understanding of the topic.

This paper supports attempts to build disciplinary knowledge of the environment by introducing core environmental literacy courses early on in teacher education programmes, so that environmental knowledge informs the pedagogy of teachers.

ESD owes much to its mother concept, sustainable development, which has been described as allowing 'people with widely different views to accept it to some degree, but without agreeing on any of the underlying philosophical and political issues' (Stevenson, 2006:278). This paper recognises that ESD is a political initiative; designed by policy-makers to gain wider support than environmental education has ever achieved. It has made its way into international agreements, national policies and education agendas. However, the gap between 'policy sloganising and policy implementation is very great' (Stables & Scott in Stevenson, 2006:287). The challenge for educators is to use ESD to open doors, but not to lose their way once they are in. The challenge is to re-embrace a foundation of deep disciplinary knowledge which goes beyond personal experience; for educators from different school disciplines to celebrate their specialisations and use them to create meaningful environmental education where learners

armed with knowledge are motivated to work creatively in the interface between human society and the natural environment.

Notes on the Contributor

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Endnote

1. In 2007, 60% of the 33 students enrolled in the compulsory environmental education module for final-year Bachelor of Education students felt that the module had an important role in creating awareness of the importance of environment in their teaching.

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Eco-Schools and the Quality of Education in South Africa: Realising the potential

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Abstract

Eco-Schools South Africa is increasingly being used by external partners as a framework for supporting environmental education in schools. This paper shares the findings of a recent evaluation of the programme in relation to the quality of education in South African schools. Do Eco-Schools activities help to improve the conditions of teaching and learning? Or do they take teachers and students away from their core focus? Evaluation of learner and teacher work in Eco-Schools found signs of the quality problems that currently plague the schools system, and there is evidence that the programme can add to the complexity to which many teachers struggle to respond. The evaluation also found, however, that the programme has significant potential to improve conditions for teaching and learning. The paper is an opportunity to reflect on how environmental education support for schools, in general, and Eco-Schools South Africa, in particular, can detract from and strengthen teaching and learning.

Introduction

The vision of creating sustainable opportunities for all to live decently involves enormous challenges. South Africa, while not unique in this regard, is a particularly vivid example. Fourteen years after the introduction of democratic governance which foretold social justice and economic redress, this challenge is still a daily reality.

Since 1994 a swathe of progressive policies has been adopted by the new government. Environmental sustainability and equal access to natural resources feature strongly in many of these new policies, such as the National Environmental Management Act (NEMA) (RSA, 1998a), the National Water Act (RSA, 1998b), and the National Curriculum Statements (RSA, 2002, 2003). Education policies are focused on redressing past inequalities, on the relevance of curriculum content and on active participation in community life in a new democracy and a global economy.

But in implementation South Africa is falling short. Capacity to coherently interpret policies, and to effectively provide resources, staff and systems for implementation, hamper many government departments. This is the case in schools education. In the second decade of South Africa's democracy, the schooling system is described as 'inefficient' and the skills produced expensive and of low quality (Taylor, 2007). In international comparative studies, the majority of South African learners fare poorly indeed. In a country with a high unemployment

rate, dwindling natural resources and one of the highest inequality indexes in the world, this is a dire problem.

It is in this context that environmental educators in government departments and non-governmental organisations (NGOs) are encouraging teachers to conduct environmental education. Environmental policies such as NEMA endorse environmental education in schools. In the National Curriculum Statements, the principles of a healthy environment, social and environmental justice and human rights underpin all learning areas and subjects, in primary and secondary schools. These principles are given effect through particular learning outcomes in Social and Natural Sciences and in subjects like Technology, Design, Tourism, Agriculture, and Life Orientation, a compulsory learning area for life skills and citizenship. Concepts and values like sustainability, respect for the environment, responsibility and participation, feature across the curriculum.

NGOs and state departments that want to respond to the policy imperative and support environmental education in schools have come increasingly to use the Eco-Schools programme as a conduit.

Eco-Schools South Africa was launched in 2003 by the Wildlife and Environment Society of South Africa (WESSA) and the World Wide Fund for Nature (WWF) South Africa (funding conduit). In four years, the programme grew from 115 schools and education centres registered, to 884 schools and centres registered in 2007. Some 55 corporate, government and other partners currently support Eco-Schools, contributing to a budget now exceeding R3 million (around US $300 000) per annum. Through a national office in KwaZulu-Natal, a system of regional coordinators (in seven of the nine provinces) and node coordinators (responsible for school visits) the programme involves hundreds of teachers and thousands of learners in a cross-section of South African schools.

Eco-Schools South Africa is affiliated with the international Foundation for Environmental Education, which endorses the award of Green Flags to schools meeting the criteria in 43 countries worldwide.[1] Participating teachers must start and maintain environmental improvements at their school, ideally involving learners and community. In South Africa popular projects are food gardens, improving school grounds, recycling, soil and wetland rehabilitation, and reducing water and energy use. Environmental management projects must be used towards formal learning, and to receive the Green Flag in South Africa teachers must also submit evidence of environmental lessons taught. Environmental improvements and teaching must be sustained and expanded on an annual basis so as to develop in the 'whole school', an ethos and lasting basis for environmental action and education.

The commitment of learners and teachers alike, and the many examples of enthusiastically implemented projects across South Africa, from rural farm schools to well-resourced city schools, uplift the spirit of observers and make for excellent publicity. But what is the *substance* within the action? Do the Eco-School activities, made possible by the concerted efforts of the partners, the availability of funds and the extra work required from students and their teachers, help or hinder education in our schools? Given the poor performance of the system, this is a pertinent question.

In 2007 WESSA and WWF, with the support of the Cape Action for People and Environment (CAPE) Conservation Education Programme at Rhodes University, convened an evaluation of

the Eco-Schools programme. The evaluation probed various aspects of the project, which were identified by staff and partners as areas for exploration. This paper shares findings specifically on the substance and quality of the Eco-Schools activities against the backdrop of the conditions of teaching and learning in South African schools.

Do Eco-Schools activities help to improve these conditions? Or are they a distraction, taking teachers and students away from the core business of teaching and learning? Building on the evaluation of Eco-Schools South Africa, this paper is part of an ongoing effort to work through these questions with programme staff and partners.

Background: Quality Issues in South African Schools

> *'We've got a big problem with reading. All of sudden, things are falling apart.'*
>
> (Grade 7 teacher, Cape Town)

A useful starting point for evaluating the Eco-Schools project is an analysis of the quality of schools education in South Africa today, and the factors associated with poor performance. The focus here is on those conditions on which the Eco-Schools programme may have particular bearing.

The matriculation pass rate in South Africa, which measures learners' performance at the end of 12 years of schooling, has been a matter of concern for some time. 2007 was no exception, with only 65% of students passing the final examination, and a mere 15% qualifying for university entry.[2]

But many South Africans were shocked to learn how much poorer the country's youth were performing compared to children elsewhere in Africa. In 2000 the Southern and Eastern African Consortium for Monitoring Educational Quality (SACMEQ) tested Grade 6 learners in 14 countries.[3] South Africa placed ninth, behind neighbouring Mozambique. In the same year Grade 4 learners' scores for life skills put them second-last among 12 African countries participating in UNESCO-UNICEF's Monitoring Learning Achievement Project (DoE, 2000).

When universal access to schooling is first introduced, an initial drop in quality can be expected, as the system adjusts to the higher number of students. This may explain why Mozambique (which produces one-sixth of South Africa's GDP) fared better in the SACMEQ tests – only around 30% of Mozambican children go to school, while in South Africa enrolment is nearly 100%.

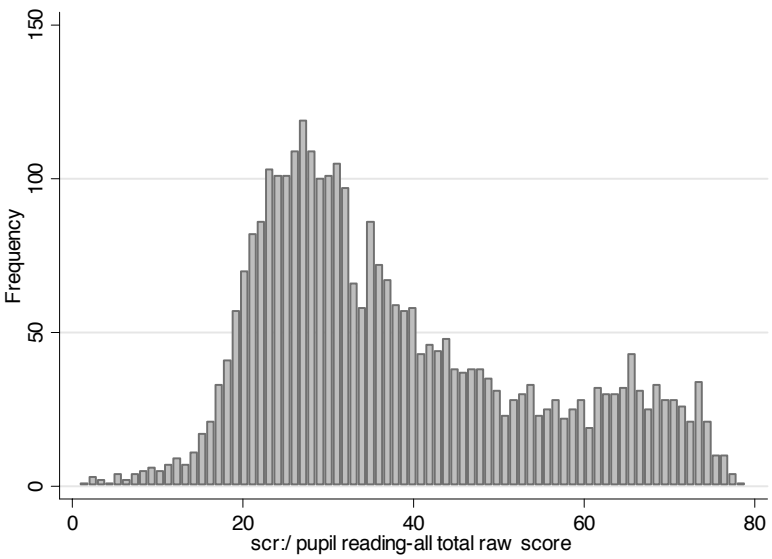
But universal access to schooling was introduced in South Africa in 1995, and while significant portions of the fiscal budget have been directed to education, along with an estimated R1 billion per annum of foreign aid and local corporate social investments (Taylor, Muller & Vinjevold, 2004[4]), results have not improved in the following decade.

In the 2003 Trends in Mathematics and Science Study (TIMSS) (Reddy, 2006), South Africa was last among 30 developed and developing countries. In that year the Department of Education also reported that 61% of students cannot read or write at the age when they are expected to do so. In 2005, the Progress in International Reading Literacy (PIRLS) study (Van

Staden, 2006) tested literacy in children after four years in school across 40 countries. South Africa came last.

What lies behind these results? Firstly, there is a stark variation in learner performance among South African schools. An analysis of the 2000 SACMEQ data by Martin Gustaffson (2005) shows a bimodial curve in the South African data: learner scores on various indices (including reading) (Figure 1) form two peaks, with some 20% of learners faring as well as others in the rest of the world, and the majority underachieving dramatically. The difference between the two peaks is not race. White learners made up only 6% of Grade 6 learners in 2000. Therefore 14% of the children who scored satisfactorily would have been from other race groups. Gustafsson suggests that some two-thirds of the 14% of higher scoring learners would be African, and the remaining third would be either Coloured or Indian. The great majority of children in the low-scoring peak would be black.

Figure 1. South African Grade 6 learners' reading scores in the 2000 SACMEQ study



Source: Gustaffson (2005)

South Africa was and still is a highly unequal society. Due to our apartheid history, in which unequal education played a major role, a majority of teachers were trained in the low-skills framework of what was termed Bantu Education, and many went into teaching significantly under-qualified for the job. Today, learner under-achievement is particularly evident in:

- Schools with a Bantu Education legacy.
- Schools where teachers are still poorly qualified.
- Schools with a high poverty index. (Crouch & Mabogoane, 1998, cited in Taylor, 2001).

Poverty at home influences a child's ability to succeed at school in many ways. It is associated with insecurity and low self-esteem; violence, aggression and stress; inadequate nutrition; crowding

and inadequate facilities. International research has also shown that children from impoverished homes struggle to make sense of the academic, formal or principled knowledge they encounter at school (as opposed to their everyday or experiential knowledge). Unlike their middle-class counterparts, they do not arrive at school with conceptual foundations already in place, and home does not reinforce what they do at school (parents are often absent or under-educated, there may be few or no books at home, and at times no culture of reading and discussion).

Poverty also affects what schools can offer children. South African parents can be exempted from paying school fees, but this leads to a lower funding base at the school. The school thus has to raise additional funding, or make do with less.

Language is another critical factor. Learners are severely disadvantaged if the language of instruction and their home language do not coincide, and this is the case in most South African schools. Many teachers teach in a language which their students do not speak at home, and in which they themselves are not proficient. The PIRLS studies indicate that many South African children are also unable to read and write in their home language (Van Staden, 2006).

Of significance for school support projects like Eco-Schools is Gustaffson's (2005) finding that the socio-economic circumstances of the school community is not always the main or only variable that determines learning results in our schools. Some very poor schools produce good results. It was also noted previously that the students' race is not a determining factor. What, then, are the other factors involved?

Gustaffsen (2005) found time management in schools to be a significant variable associated with poor learner performance – a variable that did not feature in other countries in the SACMEQ study. This would support a popular perception that many South African teachers do not actually teach when they should be doing so. Some schools are characterised by a lack of discipline and strife among the staff, low motivation and morale, poor management and poor leadership from the principal. The main teachers' union has tended to focus on improving the conditions of teaching, and given less attention to the professional ethos of teaching.

Conditions of teaching are indeed generally difficult and affect even the most motivated teachers. The teaching profession and teacher training was rationalised in the mid-1990s. This led to lower teacher:student ratios in many schools. At the same time, teachers' administrative loads have increased. Numerous new policies and regulations have been introduced, but their interpretation, introduction and implementation have lacked clarity and depth. Training in the new curriculum has generally been poor. In 2000, only 20% of teachers surveyed regarded the in-service training they received as 'very effective', while 28% of teachers, who were associated with below-average learner scores, received no in-service training at all in the previous three years (Gustafsson, 2005). As in other government departments, provincial education departments and district offices are generally under-staffed and here, too, there is limited capacity to support teachers (see Taylor, 2007).

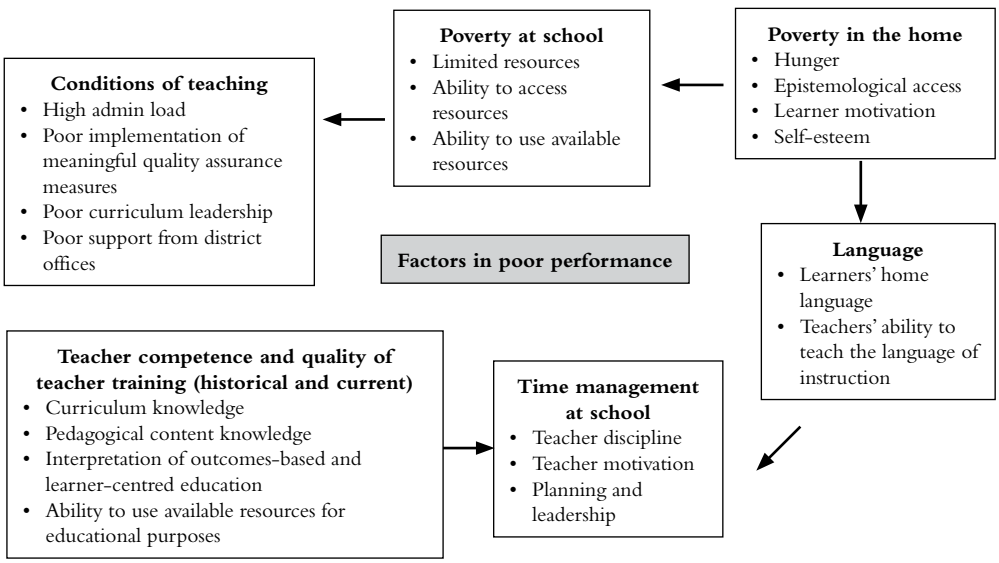
Researchers report that outcomes-based and learner-centred approaches to education are being interpreted in problematic ways, resulting in 'empty', superficial or incoherent learner activities with little content (Janse van Rensburg & Lotz-Sisitka, 2000; NEEP-GET, 2005; Taylor *et al.*, 2003). In the wake of the enthusiastic but often incoherent introduction of outcomes-based and learner-centred education in the post-1994 era, textbooks, too, have been

produced with this orientation (Lotz-Sisitka, pers. comm., 2008). The effects are exacerbated by the fact that teachers trained in the Bantu Education system have not been prepared to integrate everyday knowledge with school or formal knowledge, and many teachers find it difficult to use available content-rich resource materials effectively to plan and support lessons (see Mbanjwa, 2002; Nduna, 2003). As a result, their students fail to gain 'epistemological access' (Morrow, 2007).[5]

This difficulty of 'getting into' the formal knowledge of science, language and mathematics is deepened by impoverished home backgrounds, as described above, and, ironically, by the intention for the new curriculum to have greater relevance to all learners' lives, which has created an open-knowledge framework that many teachers are finding difficult to fill (Janse van Rensburg & Lotz-Sisitka, 2000; Jenkins, 2008; Mvula Jamela, 2007; Tundzi, 2008).

The features of the system discussed above as contributors to poor learning in schools are summarised in Figure 2.

Figure 2. Features of the system which contribute to poor learning results



Research into the most effective strategies for improving the quality of education suggests that better learner results would be achieved through interventions such as:

- Better nutrition – Gustafsson's (2005) statistical analyses predict that an extra R150 per learner per year to provide a daily meal, can achieve a 1% improvement in learner scores.
- Textbook supply – The most cost-effective current expenditure intervention to improve quality of education may be to increase learners' access to textbooks (Gustafsson, 2005).
- Better curriculum planning and leadership – Learning is enhanced when principals lead the production of curriculum year plans by teachers and monitor their implementation (Van Der Berg *et al.*, 2005, cited in Taylor, 2007).

- Better time management on the part of teachers – A staggering 85% of principals surveyed in Gustafsson's SACMEQ analysis reported that they had problems with teachers arriving late at school. Gustafsson suggests that, should this problem be resolved, there would be a 15% improvement in learner scores. Teacher motivation and leadership must be underlying factors, as well as planning skills.
- High-quality teacher training – In-service programmes to develop the knowledge and skills of teachers is regarded as the most cost-efficient capital investment that can be made in education, provided the training is of adequate quality (Gustafsson, 2005). Teachers' proficiency in teaching reading and writing in the language of instruction, is a critical factor in learners' success, as is their subject knowledge (Carnoy *et al.*, 2008). Teachers' ability to pace delivery of the curriculum for the learners, degree of curriculum coverage across grades and related curriculum management (planning and assessment) also seem to be powerful cumulative factors in building learners' knowledge.

These analyses can guide Eco-Schools staff in how they approach working with schools and teachers.

Also relevant is the three-part classification of schools by Hopkins *et al.*, which was recorded in South Africa by Christie and Potterton (1997). Type II and III schools can benefit from outside efforts to help improve education quality because there is some capacity at the school, and it is functional to at least some extent. Type I schools, however, are deeply dysfunctional and require structural interventions by government (e.g. replacement of the principal) before a change will be observed. Without such intervention, neither sanctions nor reward systems are likely to have an effect on education quality (Taylor & Prinsloo, 2005).

Evaluation of Eco-Schools South Africa

The evaluation of Eco-Schools South Africa in 2007/2008 found that the programme was growing in size, scope and significance, and that it has become an important initiative in the South African environmental education landscape – often a first port of call for agencies that want to support environmental education in schools. As such, the project has growing responsibilities, and there is a need to strengthen its capacity (staff, systems, management) to respond adequately to the context in which it works. Findings are reported more comprehensively in Rosenberg (2008b). This paper looks only at aspects related to the quality of activities in schools.

The evaluation drew on social sciences methodologies, including elements of ethnography (participant observation) and participatory research. The study was also informed by a 'realistic' evaluation framework (Pawson & Tilley, 1997).

Data sources for the evaluation as a whole were:

- Educator's Survey in 2006 (55 teacher respondents).
- C.A.P.E. Review through a questionnaire and two workshops in 2007 (58 teachers and conservation partners participated).
- Funder survey – conducted among 19 funders, six of whom responded.

- Eco-Schools' portfolios – an overview of some 20 portfolios submitted during 2007 and 2008 in the Western Cape, and an in-depth assessment of eight of these.
- Statistical analyses using data on the Eco-Schools database.
- Meetings, electronic discussions and informal conversations with teachers and Eco-School staff and partners.
- Document analysis including national and local reports.

To assess the quality and substance of the activities in Eco-Schools, eight Eco-Schools portfolios were studied. These portfolios are compiled by schools and serve as the basis on which a Green Flag may be awarded. Each portfolio must contain evidence of:

- Whole school involvement (through a School Eco-Committee and Eco-Code).
- Planning (using a 'reflect-plan-act-reflect-plan again' cycle).
- Audits conducted at the school as the basis for planning and monitoring projects.
- Environmental projects undertaken, to bring about these improvements.
- At least three environmental education lessons, related to each action project.
- Learner work.

In addition to the portfolios, the evaluation also drew on two surveys by questionnaire and workshops, which asked teachers *inter alia* about the challenges they experienced in Eco-Schools and their achievements. Informal discussions with teachers provided valuable additional insight and it was found that the portfolios were not an adequate window into what actually happens in classrooms. For example, many portfolios were put together in a hurry, and/or without a good 'feel' for what was required; with the emphasis often on 'out of the ordinary' activities. These observations in themselves provide useful insight, but not necessarily into actual classroom work, *per se*.

Findings: The Quality of Eco-Schools Activities

Not all schools which sign up for the programme manage to produce a portfolio of Eco-School work. In fact, only a fraction of the schools which register annually submit a portfolio in the same year. Table 1 provides an example from one province. Some schools need more than one year to develop their action projects and report to the point where they are willing to submit it for scrutiny. Others simply never get to this point. Observations suggest that the presence of a node or regional coordinator, to continuously motivate and monitor schools' progress, is a significant variable in some schools' success.

Table 1. Eco-Schools registration and results in the Western Cape (2007)

Portfolios Submitted	Flags Awarded	Schools Registered
34	20	107

Many teachers reported that they found it difficult to make the time for Eco-Schools activities and, in particular, for the documenting and reporting requirements. In this regard, South African teachers are not unique, as 'too much documentation' was found to be an 'obstacle' in Eco-Schools in Sweden and Catalonia, too (Mogensen & Mayer, 2005).

When schools do submit a portfolio of Eco-Schools work, their strongest suit is often their action projects. Each year the portfolios contain many inspirational examples of school improvements, often achieved against various odds; for example, rural schools producing flourishing food gardens with water hauled manually up a steep hill. These schools are often awarded a Green Flag for their tremendous efforts to improve their environment. Many of them do however find it hard to sustain and extend these efforts, particularly when supporting partners move on. Many schools also find it difficult to provide good examples of lessons and learner work.

About a third of the Eco-Schools work reflected in the portfolios reviewed for the evaluation (and in subsequent discussions with teachers) was excellent. These portfolios suggested that the teachers who put them together had a solid understanding of the knowledge and values they wanted to share with learners, and of how to help them learn. They imaginatively but coherently used the resources at hand (ranging from content-rich newspaper articles to internet access to the South African Constitution, or the trades practised in the local community) to develop a 'pool of knowledge' as the basis for learning more.

These teachers worked in a variety of schools: a well-resourced government secondary school in the city; primary schools in working-class areas, with average to poor resources; a small rural pre-school for the children of farm workers, supported by an environmental NGO. This links with Gustafsson's finding, that 'good teaching' and 'good learning' happen in a variety of South African schools with racially diverse students (and teachers). It also suggests that, inherently, the Eco-Schools requirements do not mitigate against good teaching and learning.

In the majority of portfolios reviewed there was, however, evidence of the following:

- A lack of coherence, at multiple levels. Many teachers find it hard to develop lessons which draw meaningfully on the environmental projects the school has undertaken, even when there are obvious curriculum opportunities to do so. Opportunities to 'join the dots', consolidate or make meaningful concluding connections, are missed. Lesson content, resources and activities do not always relate to each other; and while they all relate to the same topic, broadly, they do not always address the same educational purpose – in fact, educational purpose is often unclear. These findings are in several ways similar to those by Conway *et al.* (2008) in mathematics classrooms in Gauteng.
- Learner 'work' is often at the level of participating in activities (such as forming an AIDS ribbon) and the learning from these activities is not being probed by teachers, or presented in the portfolio.
- Mistakes, misconceptions and inaccuracies (for example, causes of HIV infections and precautions against HIV infections being conflated) are not corrected by teachers. Schudel (cited in Lotz-Sisitka, 2007) also identified this issue in other Eco-Schools portfolio research. Correcting pupil error is associated with better quality teaching and learning (Reeves, 2005, cited by Taylor, 2007).

- Children have not mastered the language in which they write. At the same time, they are being presented with resources (such as worksheets) containing typing and grammatical errors, and contextually inappropriate illustrations.
- Lessons produced are at times disjointed or unnecessarily complex. In one example, the concepts 'indigenous' and 'alien' (plants) were introduced to eight-year-olds in a lesson about the value of trees, and a worksheet with an oak and squirrel (alien species) used to illustrate that trees provide food for animals. This city school could easily have accessed more appropriate examples and resources from any number of environmental agencies. The lesson may be an inappropriate amalgamation of what the teacher is used to teach to this age group (the value of trees) with the agenda of an environmental partner (introducing the concepts of indigenous and invasive alien plant species) – the latter being a significant environmental issue in South Africa, but one which is perhaps inappropriately 'marketed' to primary school learners.
- Children work at levels below what is required by the curriculum for their grade. This trend towards 'under-teaching' or mis-representation of the scope and depth of Learning Area knowledge and assessment requirements has also been identified in other classroom-based research in environmental education (Janse van Rensburg & Lotz-Sisitka, 2000; Jenkins, 2008; Lotz-Sisitka & Raven, 2001; Mvula Jamela, 2007; NEEP-GET, 2005; Tundzi, 2008). Reeves (2005, cited by Taylor, 2007:527) found that 'engaging pupils at relatively high levels of cognitive demand with respect to both principled and procedural knowledge' is a feature of pedagogical practices that lead to good results.

The reasons for these observations may be manifold and the analysis will of necessity be somewhat superficial. However, several findings point to the fact that many teachers do not have the necessary knowledge of environmental concepts and issues to design coherent lessons which draw meaningfully on action projects, and progress appropriately from grade to grade. This is borne out by an earlier evaluation in the Learning for Sustainability Project (Janse van Rensburg & Lotz-Sisitka, 2000) and recently in a survey conducted as part of the City of Cape Town Youth Conference on Sustainable Development (Rosenberg, 2008a), in which the majority of teachers reported that they were not confident about their knowledge of related environmental matters. A similar research finding has been reported by Schudel (cited in Lotz-Sisitka, 2007); Jenkins (2008); Mvula Jamela (2007); Tundzi (2008) and others (e.g. Taylor *et al.*, 1999; Lotz-Sisitka & Raven, 2001).

Secondly, it would seem that in the wake of both Bantu Education training and the particular manner in which the new learner-centred and outcomes-based education frameworks were introduced, many teachers have been left unsure as to how to put together a meaningful educational programme with appropriate content and activities so as to lead coherently to particular intended outcomes. Elsewhere Lotz-Sisitka (2007:4) has reported that teachers seem not to know 'how to enable the children to understand the concepts they were meant to teach them'.

The Eco-Schools portfolios also reflect the difficulty some teachers have in using resources effectively to plan and support these activities – difficulties that have also been noted by Mbanjwa (2002) and Nduna (2003) outside the context of Eco-Schools.

Thirdly, planning is clearly a challenge for some, and many schools are not able to fit environmental projects and lessons coherently into the year plan. Some still fail to see that environmental education is an integral part of the formal curriculum. Partner agendas can complicate the situation. One teacher reported their Eco-Schools challenge as: 'Coming up with concept that will fit into our curriculum and funding linkages.'

In summary, learner and teacher work in Eco-Schools show signs of the problems with the quality of education described earlier as part of the current conditions in the system, and there are indications that the programme at times adds to the complexity to which some educators struggle to respond coherently. On the other hand, the evaluation also found that Eco-Schools has the potential to strengthen teaching and learning, and that many teachers highly value the programme's contribution in this regard.

Teachers welcomed the input of Eco-School staff, particularly in relation to understanding and implementing the new curriculum. A teacher from the Eastern Cape wrote: 'We want [Eco-Schools] to stay in our school because it is very useful … We need full support from you.' Noting that the programme is in accordance with the new curriculum, she asked for ongoing support to help her master the new planning framework for lessons and learning programmes. A departmental official considered the relevance of Eco-Schools to be 'a tool to fill the voids of teacher competence' and described support to teachers through the programme as 'tremendous'. Another teacher described official training as 'not good' and suggested that curriculum support could be provided through Eco-Schools, as it would be a 'good way to implement what [the education departments] are trying to achieve'. I will now examine the programme's potential to strengthen the quality of education.

Discussion: Eco-Schools Potential

Programmes like Eco-Schools are perhaps not designed first and foremost to improve the quality of education, but they can and must make a contribution. Eco-Schools South Africa has evolved along with the new education system in South Africa, and many of its key features have the potential to support schools and the new education framework. How do these features play out in practice, and how can they be strengthened?

The school development researchers cited in this paper propose multi-facetted strategies to improve the quality of education in South African schools. Eco-Schools, with its combination of practical environmental improvement projects, teacher support for better curriculum-based lessons and attention to planning and management, does indeed address a number of facets described by these researchers as likely to help improve the quality of teaching and learning.

These include:

- Poverty and learner motivation.
- Whole school management and planning.

- Resources to support teaching and learning.
- Teacher motivation.
- Teacher competence.
- Curriculum management and delivery.

All of these interrelated aspects can be linked to the focus areas of Whole School Evaluation in the Department of Education's Quality Management System.[6]

Eco-Schools, Poverty and Learner Motivation

Many teachers and Eco-Schools partners regard the programme's ability to address the effects of poverty on the local environment, the community and the learners, as its most valuable feature. Through school vegetable gardens and soup kitchens, Eco-School projects address hunger among learners and community, and flower gardens are an opportunity to restore pride in downcast neighbourhoods.

Children participating in environmental improvement projects have a chance to feel good about themselves and their ability to make a difference. They might be able to overcome the apathy and helplessness associated with being aware of environmental problems, but being unable to do anything about it. Spending time in the outdoors as member of an Eco-Club can relieve the stress of living in a crowded home with violence and insecurity. Rewards for their efforts to gain a Green Flag may also help to overcome feelings of worthlessness which might stem from failure to grasp academic concepts; this might just be the impetus to try again to master those concepts.

Studies elsewhere reported that participation in environmental education programmes has improved learner's academic performance, and Eco-Schools teachers noted instances of learners arriving in Grade 7 unable to read, showing remarkable progress by the end of the Eco-School year. While this evaluation has not been able to look into learner performance, it is an area worth exploring in future.

The potential of the programme to motivate learners is unfortunately not always achieved. Some teachers report, for example, how their students resent being made to work in the garden, and how they must constantly remind them of their Eco-School 'duties'. Perhaps these teachers need more guidance to integrate the hands-on activities and experiences with curriculum-related learning, as it is important to avoid children becoming no more than labourers outside the classroom.

Eco-Schools, Whole School Management and Planning

Eco-Schools have the potential to improve planning and management at schools through the following programme requirements:

- Development of an Eco-Code or School Environmental Policy – These require staff and leadership to work together to define and implement a common vision.

- Whole school involvement – As for previous.
- Planning cycles – The staff and management must assess their environment and plan actions to improve it. The process must be monitored, thus increasing the chances of implementation and accountability and because of the annual cycles (rather than a once-off initiative), schools have a chance to learn and use their learning to plan better next time.
- Reporting requirements – The Eco-Schools portfolio requires record-keeping, encourages accountability and communication, and provides a basis on which future activities can build (for example, if a new teacher takes over).

For some teachers, better planning was among their biggest achievements in Eco-Schools:

- 'We have been involved with the programme for three years and it has become part of our school running and management.'
- 'The toolkit has … taught us programme management method used now across all activities. Is now a standard way of working'.
- 'We reflect on our work on a quarterly basis and improve where we did not do well, and re-plan again'.

On the down-side, audits are not always used effectively in Eco-Schools, and many teachers report whole school involvement as a significant challenge. Often, a single enthusiastic teacher carries the programme alone. Also, not all schools manage to 'fit' Eco-Schools into their planning, and the timely guidance from Eco-Schools staff seems critical.

Should Eco-Schools avoid working with 'Type I' or dysfunctional schools, because it is seemingly impossible to make a difference to the school's 'performance'? While such schools may be characterised by strife among staff factions and poor leadership, they may also have teachers who want to make a difference, and battle to do so under the circumstances. Such teachers can be motivated and retained for the teaching profession through involvement with an inspirational programme like Eco-Schools. They may benefit from the affirmation, the networks, access to resources they might not otherwise come across, and the opportunity to compare themselves with what is achieved in other schools. In such cases, whole school involvement might not be attained, but when approached well (for example, through careful comment on the teacher's portfolio of evidence) the programme can keep alive a recognition of the educational role schools must play.

Eco-Schools and Resources to Support Teaching and Learning

Eco-Schools provides access to resources in the form of links to environmental service providers who can provide excursions to natural areas, potential funders, and local authorities and government departments able to assist with school improvements such as toilets, water tanks, waste management and gardens. These infrastructural improvements improve the context in which teaching and learning takes place, and gaining access to these partner networks is a significant benefit for many Eco-Schools.

The programme also provides teachers directly with teaching and learning materials. The evaluation has shown that few teachers use resources that are simply distributed via mail. Resources are ideally introduced through a supported process, such as a teachers' course, if they are to be used effectively. Even this is not always successful, and more research into how to strengthen teachers in using available resources effectively to strengthen teaching and learning, is very necessary.[7]

More attention should perhaps be given to the provision of resources that could be used to strengthen reading and writing in the languages of instruction, to support both literacy and environmental learning. In this regard a project currently underway at Rhodes University[8] to produce Eco-Schools resource packs with stories and fact sheets, can be particularly valuable. Mbanjwa's (2002) research indicates the significance of including basic fact sheets in resource packs, since they help to improve teachers' knowledge of the topic and provided reading materials that the teacher could adapt or translate for learners.

Eco-Schools and Teacher Motivation

Eco-Schools certainly has the potential to motivate teachers and boost their morale. This takes place not only through national and peer recognition in the award of a Green Flag. Teachers are also motivated by opportunities to do something about contextual socio-economic conditions like hunger, poverty and unemployment, and the fact that the programme helps schools to act as resources in their community, and as sources of pride, was very significant to teachers who participated in the evaluation. Teachers also value the opportunity to compare what they do in their schools with others, and such benchmarks can help them 'set the bar higher' for themselves, their learners and their management.

The research on the factors affecting learner performance in South African schools suggests that teacher motivation plays a role, and is almost certainly a contributing factor in teachers arriving late at school. By increasing teacher morale, programmes like Eco-Schools can therefore contribute to schools' performance in quite a significant measure.

The evaluation found that teachers are motivated by visits from node, regional or national coordinators. However, the recognition of the teacher's own principal is also vital, and teachers report this as a key factor keeping them in the programme. Similarly, they would like recognition from their departmental structures. This points to the need to integrate Eco-Schools' achievements into the Whole School Evaluation process that forms part of the departmental quality management system. The discussion here would suggest that this would be very easy to do, given a considerable degree of overlap.[9]

Eco-Schools and Teacher Competence

As noted above, both teachers and departmental officials had praise for the support from the programme to help teachers understand and implement the new curriculum. These reports are somewhat surprising, given that not all Eco-Schools staff and partners have experience with

or conceptual insight into the new curriculum. It is a programme feature which should be strengthened and built upon.

Eco-Schools also has the potential to improve the environmental and therefore subject knowledge of teachers. It already provides information in the form of resources, and acts as a conduit through which environmental agencies can distribute materials and provide training. Several Eco-Schools teachers have enrolled for formal and non-formal environmental education courses.

This potential is, however, only realised if the information and training provided are of good quality, of sufficient depth, and accessible. This is vital, as teachers' subject – or pedagogic content – knowledge has such a strong link to learner performance (Conway *et al.*, 2008). Limited knowledge on the part of the teachers would explain the superficial activities that seem devoid of content and/or are at too low a level for the particular grade, that have been observed in some Eco-Schools portfolios. As noted above, there is also a need for concomitant support to help teachers develop a culture of and competence in using additional material to inform and deliver lessons.

Through its emphasis on linking practical environmental projects with curriculum learning, Eco-Schools provide teachers with opportunities to bridge between the everyday knowledge or experiences of learners and the formal knowledge required by the curriculum (and the world of work). If this opportunity to improve epistemological access is to be fully realised, however, the quality and coherence of lessons, activities, content and learner resources needs to be addressed as a matter of urgency.

Eco-Schools and Curriculum Planning

Research suggests that curriculum leadership, consisting of overseeing the planning of the curriculum for the year, monitoring delivery and supporting teachers, tends to distinguish better performing schools from the rest. Also significant in determining learner results is curriculum coverage in the classroom, teaching to the appropriate level of cognitive demand, and providing adequate quantities of reading, writing and homework. These factors make up what one could call an 'opportunity to learn'.

Eco-Schools have the potential to improve curriculum planning at schools. The whole school audit (which includes a curriculum audit) and planning framework encourage teachers to think about the year in advance, and tools like the Year of Special Days calendar assist with placing a particular environmental focus in, for example, a particular term.

However, the lack of coherence between many lessons and projects reported by Eco-Schools indicates that planning was in many cases not optimal.

The potential of Eco-Schools to help schools with curriculum planning can be stifled when additional donor agendas are introduced in such a way that teachers are forced to use additional frameworks (partner agendas) to plan projects and lessons. This relates perhaps more to the timing of the introduction of these agendas than the content, as most partner interests (endangered species, energy conservation, etc.) can be meaningfully taught through the existing

curriculum framework. Planning does however need to be done well in advance if it is to be meaningfully integrated in a teacher's year plan.

Obviously, environmental agencies should be mindful that their activities do not detract from schools' core business of teaching and learning. Eco-Schools criteria should not require teachers to 'jump through hoops' which do not help them with better management, planning and teaching. In 2008 the programme took a step in the right direction by introducing a staggered award framework and simplifying the toolkit and requirements (Share-Net, 2008).

All Eco-Schools steps (such as reporting) should be streamlined – that is, stripped of embellishments that are 'nice to have's' for researchers or funders, but not in the interest of the schools – and, on the other hand, strengthened, to have maximum value. Benefits to teachers, partners and researchers need not be mutually exclusive. Eco-School audits and reports which can be used for official quality assurance purposes would be an example of 'making Eco-Schools count' for teachers, and could also be a source of information for researchers and partners on the conditions affecting schools. Eco-Schools as an opportunity to strengthen curriculum and subject knowledge is another example of adding value rather than detracting from core business. As noted above, however, teacher development activities must be relevant to teachers' needs and of high quality. When they waste a teacher's time, they waste a child's opportunity to learn. This has implications for the capacity of Eco-Schools staff and partners, who should be adequately prepared and knowledgeable about the formal education context as well as environmental education in order to provide support that strengthens rather than detracts.

Conclusion

Any agency which engages South African schools to support environmental education must acknowledge the quality crisis in the majority of schools. Schools' partners need to consider the contours of this crisis by noting available research and developing an evidence-based grasp of the conditions and practices in the actual schools with which they work.

The Eco-Schools programme has considerable potential. Some of this is recognised and realised, and this is giving the programme a high level of popularity and relevance. Some of the potential is not being realised, and this is perhaps largely due to the conditions in the schools themselves. However, this review has indicated a number of areas in which Eco-Schools staff and partners can strengthen their ability to support schools and help improve the quality of education. There is a need to protect and promote those areas in which the programme is strong, but also to address those areas where the programme might fail to support progress in schools.

Between the lines of this paper are many ideas for further research, and it is hoped that researchers with an interest in school-based environmental education will pick up some of the many questions and opportunities illuminated by this evaluation of Eco-Schools South Africa, in the interest of better education.

Notes on the Contributor

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Endnotes

1. For more information on Eco-Schools, consult the project website at www.eco-schools.org.
2. www.education.gov.za, visited January 2008.
3. www.sacmeq.org, visited January 2008.
4. Most of the learner achievement studies reviewed here have been framed within what Barrett *et al*. (2006) call an economist approach to educational quality – a concern with efficiency, effectiveness and achieving learning outcomes at reasonable cost. A humanist/progressive frame for understanding educational quality is, by contrast, concerned with the development of the whole child, human development and social change.
5. For a related review, see Lotz-Sisitka (2007).
6. www.education.gov.za, visited January 2008.
7. Some such studies have already been undertaken, for example by Mbanjwa (2002) and Nduna (2003), but this body of research needs to be extended.
8. The resources will be published through Share-Net (www.wessa.org.za/sharenet.asp) and on www.handsforchange.org.
9. See an earlier discussion by Lotz-Sisitka *et al*. (2005).

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Contextualising Formal Education for Improved Relevance: A case from the Rufiji wetlands, Tanzania

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Abstract

The aim of this action research case study was to engage a community of villagers, teachers, students and district officers in a participatory process to adapt a module of a school curriculum to the local context, and teach it in order to describe one way in which contextualisation, using local and indigenous knowledge and active discovery teaching-learning processes, can be done. The major research question was: Does integrating local environmental cultural knowledge into formal schooling contribute to curriculum relevance? If so, in what way?

This paper summarises the background and context of the research, the motivation and the theoretical basis for the work, the methodology and methods, and the action research process itself. The results are interpreted and discussed in light of current theoretical perspectives on education and environmental education. The main findings within the case are that contextualisation improved relevance of education and thus its quality by:

- *Breaking through traditional frames/barriers between teachers and students, students and elders and community and teachers.*
- *Allowing formal education to take place outside of the school.*
- *Necessitating a change in pedagogy to more learner-centred discovery methods.*
- *Allowing indigenous knowledge to come into the classroom.*
- *Stimulating creativity and increased confidence.*
- *Bringing local socio-political environmental issues into the classroom.*

Background

Children in the Rufiji wetland of Tanzania, even when they manage to get formal schooling, have difficulty passing the final (Standard VII) exams (Hogan, 2006). There are many reasons for this, which persist nationally and negatively affect the quality of education in primary schools; including scarcity of qualified teachers, teaching-learning processes, materials and equipment, poor access to wider reading resources, low support capacity in the home (including parent illiteracy), nutritional deficits and resource limitations (Mrutu, Ponera & Nkumbi, 2005; Rajani *et al.*, 2001). The waiving of primary education fees in 2002 resulted in an increase of 1.6 million children enrolling in schools, thus putting increased stress on the system and making it difficult to maintain even the poor quality of education (Buston, 2003). Half of Tanzanian schoolchildren have no help at home for their studies and the majority have no access to

reading materials (Mrutu *et al.*, 2005). This deprives them of opportunities for making their own investigations and makes them highly dependent on teachers as their source of knowledge.

The national education service delivery problems are exacerbated in the Rufiji River floodplain and delta because of the dynamic physical environment of its wetland, which constrains land travel and communications and discourages government personnel from persevering there. Schoolgoers of the zone in which Rufiji lies (Eastern Zone) are the most disadvantaged nationally with regard to the availability of reading materials at home and the region also has a relatively low percentage (60%) of pupils who get three meals per day (Mrutu *et al.*, 2005). These factors influence the effectiveness of schooling. National and district education departments are trying to redress the situation, but within a standardised formal curriculum and a pedagogy not applied to the extremes of the environment or the natural-resource dependent lifestyle of wetland children.

Traditional African pedagogies and educational philosophies which were communal and strongly embedded in the community are not integrated widely in the Tanzanian formal education system The aims of the present educational system in Tanzania provide for a re-appropriation of indigenous knowledge and ways of knowing by including '… the promotion and acquisition of culture, good customs and traditions of peoples of Tanzania' (URT MoEC, 1996:iii). Some use is made of stories, puzzles, proverbs and word games, but these are confined to the teaching of culture. School is separate from home and home education is not valued by the formal government educational system. Mrutu *et al.* (2005:124) report that teachers did not think it important for pupils to have reading materials at home, indicating that '… teachers regarded the role of the home in promoting reading as very minor or even negligible'. Although communities are involved in school management in Tanzania, they are usually excluded from decisions regarding teaching and learning.

The Continuing Basic Education in Tanzania (COBET) (MEMKWA is the Swahili acronym for this programme) system of schooling demonstrates a shift by the Ministry of Education and Culture (MoEC) towards a more active learner-centred and learned-led education methodology. COBET is a crash programme to compensate for the loss of education by 1.6 million children over ten years of age who remained out of school in the early 2000s (TIE, 2005:vii) and COBET teachers are referred to as facilitators. One of its two main functions is: '… ensuring delivery of a relevant and competence-based courses of study through a well-designed curriculum, delivered through interactive child-friendly and participatory approaches' (TIE, 2005:viii).

COBET facilitators receive training (albeit for only 12 days) in participatory methods and are encouraged to use demonstration, discussion, role-play, songs, study visits, guest speakers and small group activity amongst their teaching methods (URT MoEC, 2005); thus opening opportunities for learners to be discoverers of knowledge through their own research. Facilitators are expected to be 'loving and caring' and are advised that corporal punishment are not solutions for misbehaviour as these may be the reason for dropping out of school in the first place. The COBET/MEMKWA programme addresses the relationship between the school, parents and the surrounding community. The roles of the parents and community is to provide facilities (e.g. classroom furniture and security of assets) and to motivate students to go

to school and study. There is no consideration of a parental role or community role in lesson planning or curriculum decisions.

This action research case study tested one module in the COBET curriculum with one COBET class in one school, Nyamakurukuru, in Rufiji District. The aim was to engage a community of villagers, teachers, students and district officers in a participatory process to adapt a module of a school curriculum to the local context, and teach it in order to describe one way in which contextualisation, using local and indigenous knowledge and active discovery teaching-learning processes, can be done.

The major research question under examination for this specific case was: Does integrating local environmental cultural knowledge into formal schooling contribute to curriculum relevance? If so, in what way?

The Research Site: Nyamakurukuru School and Community

A school was built at Nyamakurukuru after independence in 1969, but in 1974 when Ujamaa villagisation was enforced the population was forced to migrate and the schoolhouse was abandoned. In 2000 it was recognised that most of the adult population in the sub-village were unable to read or write. This appalled the sub-village chairperson, who in September 2003 opened a school in a shack which 120 children attended. At the end of 2004 the Education Ministry, under the COBET scheme, trained two voluntary facilitators for 12 days and one professional schoolteacher was appointed as school principal.

At the time of writing, the population of the sub-village was 776 (367 female and 413 male) and was mainly comprised of members from the waNdengereko tribe, but also waNgindo, waPogoro, waSukuma and waBarbaig. There were 139 children registered at the school. Those who completed three years of COBET took Standard IV exams and have now been integrated into mainstream primary education in a Standard V class. The classes which currently run are Standard I, Standard II, Standard V and a Cohort I Year 3 COBET class. There are two classrooms and three active teachers. One teachers' house has been built and this is shared between two teachers (one of whom is accompanied by his family).

The school is accessible by two routes from Utete, but neither is reliable in the wet season. The school, situated in woodland of mixed Miombo and Lowland Coastal forest vegetation, is about 100 metres from the wetland between Lake Lugongwe and the Lug'onya and Rufiji rivers. A well, for domestic water supply, has been dug in the wetland near Lug'onya River. Bushbabies, bats, owls, jackals, hyenas and elephants can be heard at night. There are crocodiles and hippopotami in the rivers. Small antelope, and probably other species, are hunted for meat. Low mesh sizes are used for fishing very small fish.

Theoretical Perspectives on Contextualisation and Relevance

Macro and micro studies of the meaning of quality education are underway and have found relevance among the 'five dimensions of quality that are recurring themes of debate on quality' (Barrett *et al.*, 2006:2). These are effectiveness, efficiency, equality, relevance and sustainability.

By contextualisation, I refer to changes/adjustments in the area which Bernstein (1990) terms the 'primary contextualising context' where local pedagogic discourse (LPD) can take place. This is the interactive area between the three learning environments which schoolchildren inhabit – the home, the community and the school. Community involvement in children's education is seen by educationalists as a valuable contribution to the relevance of education in the lives of its learners. Moll and Greenberg (1990:345-346), amongst others, urged that meaningful connections be created between academic and social life through the concrete learning activities of the students.

'Classification' during the process of contextualisation refers to 'what' will be transmitted in terms of 'categories, contents and relationships' while 'framing' refers to 'how' the knowledge will be transmitted (Bernstein, 1990:195). A highly framed system is characterised by the distinct hierarchical positions of students to teachers, teachers to education officers and curriculum developers. In a strongly classified and framed educational system such as that of Tanzania's formal education system (except for pilot sub-systems such as COBET), there is limited latitude for the teachers ('transmitters'), who are low on the hierarchy of power, to adapt the curriculum to local contexts. Taylor and Mulhall (2001:143-144) found that 'the rigidity of primary school curricula seemed to discourage teachers from moving beyond the boundaries of the subject area'. Bernstein (1990) referred to the clear separation of subjects from each other, with little recognition of overlaps or cross-cutting concepts, as strong horizontal knowledge classification. An over-rigid curriculum is identified as a constraint to contextualisation and presents a challenge to environmental educators.

In Zimbabwe, Chikunda (2007:168) recommends that 'improvement of basic education and re-orienting existing education should aim at developing knowledge and skills for citizens to jointly identify their problems and act on them in a sustainable manner'. This requires the freedom to teach holistically across subject divisions and proposes a situation whereby the context is defining the curriculum. Taylor and Mulhall (2001), following research in four countries (including Tanzania), and Vandenbosch (2007) show positive results from their case studies of contextualisation at school-home-community level. Vandenbosch gives examples from western Kenya and the Philippines which show how the content and the teaching-learning processes, when adapted to the local environment, natural resources or agricultural surroundings, improve the quality and relevance of education, while 'at the same time making relevant knowledge and skills available to communities …[and] … contributing to development' (2007:5-6, 8). Bridging the relationship between the school, the home and the community – or weakening the framing which separates school from the context of its operation – is a focus of both sets of studies.

The 'indigenous and local knowledge' versus 'Western scientific knowledge' dialectic is one of the many dialectics created by scholars over several centuries. Hogan (2007) discusses the origins of this and some other relevant dialectics about knowledge (sacred vs profane, book knowledge vs unorganised knowledge) and has learnt that such dialectics which set one type of knowledge against another are deliberate constructs or, in the words of Latour, are '*made*' (1999:267, italics in original). Regan terms the use of 'Western' vs 'non-Western' as a misleading dichotomy (2000). For convenience, I call the two knowledges 'indigenous knowledge' and

'Western scientific knowledge', though I, like other contemporary scholars such as Shava (2005), believe that neither are purely what these terms suggest and both have been influenced by each other and by a multiplicity of non-Western sources of knowledge.

Currently, the dominant thrust of the formal educational and knowledge systems in Tanzania, like many countries in Africa, follows cultures other than African cultures (Buchert, 1994; Brock-Utne, 2002; Hountondji, 1997; Odora-Hoppers, 2002; Reagan, 2000) and follows a Western paradigm (Millar *et al.*, 2006) which carries with it the values of a linear, neo-liberal, materialistic society that measures success in terms of quantity of material acquisition and level of academic qualification. Bernstein (1990:205) argues that 'the link between power, knowledge and consciousness is established by the pedagogic device', which provides the 'internal grammar of symbolic control … or socialisation' which forms the basis of modern education systems. Cornbleth (1990:185) observes: 'Curriculum knowledge is largely mainstream, the knowledge deemed important by dominant groups ...' and that minority and marginalised groups must advocate to have their histories, cultures and perspectives included as 'legitimate knowledge'. In Africa, and elsewhere, indigenous and local knowledge has been devalued by historical events associated with colonial intrusion, modernisation and, more recently, neo-liberalism and globalisation. It is acknowledged that, as it penetrated the world, the European pedagogic device established a clear boundary between mental and manual practice; that is, displayed a strong horizontal insulation between the teaching of academic subjects and practical skills (Bernstein, 1990). Indigenous and local knowledge encompass both mental and manual competencies.

In 1998, appalled at the poor quality of education in Tanzania in the 1990s and keenly aware of globalisation, Dr Julius Nyerere emphasised the need for relevant education, stating: 'We must educate our young people for the life which they are going to live in Tanzania [in their] corner of the Global Village [which is] rural Tanzania [or the] informal sector of urban Tanzania' (Lema *et al.*, 2004:163). According to UNESCO (2006:13) 'education based on local culture and contextual needs has been neglected in Africa'. Seventy-six indigenous and academic delegates, including Tanzanians, in a 2005 conference in Ghana suggested a new type of scholarship 'that combines indigenous knowledge with external knowledge at a collegial level' (Millar *et al.*, 2006:168). Their proposed steps towards achievement of this new type of scholarship include the integration of local experts into formal systems of knowledge and the inclusion of traditional knowledge, ways of knowing and African sciences in primary and secondary school formal curricula and pedagogies. However, the limited research done so far on the contextualisation process means that there is a limited understanding of it and therefore definitive recommendations about it are not yet possible. The Nyamakurukuru case study is intended to contribute to the understanding of contextualisation in practice, in a move towards a vision of *education in the wetlands and wetlands in the education* providing contextually relevant education for a sustainable future.

Methodology of the Process

This interpretive study had as its central endeavour 'to understand the subjective world of the human experience' (Cohen, Manion & Morrison, 2003:22). Through its interest in power

relationships, the study could be described as having a critical knowledge interest, but given its strong interest in practical changes *in situ*, the primary knowledge interest in this study could be categorised as a practical knowledge interest because its underlying assumption is that if a better understanding of their situation can be reached, then people will be able to take practical actions within it (Janse van Rensburg, 2001). I wanted to report on the 'complex dynamic and unfolding interactions of events, human relationships and other factors in a unique instance' (Cohen *et al.*, 2003:181), and therefore chose a case study methodology.

It was intended that theoretical insights would be gained which would inform others and might suggest possibilities without any certainty of what might happen in a similar case elsewhere. Bassey (1999:58) refers to such emerging theories as 'fuzzy propositions' which result from 'cause and effect relationships'. Such propositions acknowledge possible uncertainty and fallibility. 'Fuzzy generalisations' can also emerge from case study research when the fuzzy propositions are extended to similar contexts elsewhere (Bassey, 1999:84), in this case as recommendations.

Action research can be a 'powerful tool for change and improvement at the local level' (Cohen *et al.*, 2000:227). I, as participant observer with the teacher staff and school management, sought to see whether a change in the content of a lesson (more use of local examples and knowledge) and the way it was taught (discovery and action-based rather than inform and write down) could improve the relevance of the learning and the level of respect for indigenous knowledge. One cycle of Lewin's four stages in action research – planning, acting, observing and reflecting – was carried out (Lewin, 1946, 1948 cited in Cohen *et al.*, 2003). The data collection methods used were: focus workshops, lesson observation, active research observation (i.e. participant observation) and semi-structured interviews. Data was collected and given identification codes in a data inventory. Data analysis was achieved by using analytical memos to capture and facilitate 'analytical thinking' (Maxwell, 1992, in Cohen *et al.*, 2003:79) (see Table 1). Through this process I was able to capture data under category headings and thus reduce it to four themes which I used to structure the analytical memos, and then to code and organise the data using these themes in their sub-themes in the analytical memo structure. The four themes were: learner participation and responses, teachers' role and response, community role and response, and use of learning support material.

From the analytical memos I constructed the narrative using 'thick descriptions' (Cohen *et al.*, 2003:311), interspersed with vignettes (mini case studies) in order to provide adequate levels of raw data to illustrate important aspects. This led to the creation of several sub-themes. Following this, I interpreted the data drawing on the conceptual frameworks provided by the literature review until analytical statements emerged. Analytical statements are a means of trying to make sense of data by condensing them into 'meaningful statements' (Bassey, 1999:70). The analytical statements gave concrete statements of what was the case, and responded to the research question. I then I analysed why the case was such. Such interpretation enabled me to make fuzzy propositions and fuzzy generalisations which lead to forming recommendations, which addressed the research question.

Table 1. Analytical memo 1 – learner participation and responses

Category	Summary of Comments/ Opinion/Issue Arising	Data Source
Perceptions of what teaching methods are normally used	- Not related to life - Not individual teaching - Question and answer homework	- Student interviews - Responses regarding teaching methods used
Responses to group work methods	- Enjoyed doing them - Social learning - Brainstroming in research group	- Photo of engagement in group work in classroom - Observations of laughing, chatting
Perceptions of outdoor research activities	- Enjoyed doing them - Liked it - Became less shy - Less afraid of old people	- Focus group interview with two student research groups - Photo of group doing research with adults in the community
Perceptions of sources of knowledge	- Think that the teacher knows a lot - Think that elders know a lot - Think that both sources of knowledge are important	- Focus group interviews with research groups
Perceptions of what they can learn from learner-centred pedagogies	- Researching from elders helps to build students' confidence. 'Were afraid of some old persons but now less so.'	- Focus group interview with research groups.
School as a source of environmental knowledge	- Learn nothing about local environment in school - Learn not to light fires or cut trees	- Student interviews.
School as a source of knowledge relevant to their future careers	- Yes - No	- Student interviews

Findings and Discussion

Finding 1: Contextualisation contributed to relevance

In discussing the findings I address the research question, which, as mentioned above, is: Does integrating local environmental cultural knowledge into formal schooling contribute to curriculum relevance? If so, in what way?

This action research study, like others (O'Donoghue *et al.*, 2007; Taylor & Mulhall, 2001), found that integrating local environmental cultural knowledge successfully contributed to curriculum relevance both epistemologically (i.e. locally relevant knowledge, and to different

ways of knowing) and pedagogically (active, engaged learning processes situated in local context and cultures) (Hogan, 2007). It also fostered stronger school-community relationships and involved the teachers and communities in ethical deliberations about environmental concerns, as discussed in each of the aspects associated with contextualisation and education in this case (discussed in more detail below).

Finding 2: Contextualisation broke through traditional frames/barriers between teachers and students, students and elders, and community and teachers

'We let them get much closer to us; instead of feeding them we let them ask us questions' is how the head teacher at Nyamakurukuru explained this change in the relationship between teachers and students. The students felt that it gave them a different kind of access to older people and they became less shy and afraid of them. 'We get to talk to older people who know a lot' and 'It removes our shyness' were some of the comments received. The community members could see that their relationship with the teachers 'has improved because this activity showed us that we have a role to play in the education itself' (Nyamakurukuru sub-village leader, pers. comm., 2006). This represents a move towards the 'new dynamics' which Mushi, Malekela and Bhalalusesa (2002) wished to see 'between teachers, students and community knowledge holders' in order to enhance learning opportunities in Tanzanian education.

It appears that a shift in the power relations of the LPD had occurred. Bernstein (1990) claimed that this could influence the content of schooling and I support this view because in this short case study it brought local and indigenous knowledge into the classroom. This constituted a change to the usual content mainly drawn from prescribed books. This concurs with O'Donoghue *et al.* (2007), who found that in less structured, more contextually immersed pedagogies, prior indigenous knowledge can enter classroom discourse.

Vandenbosch (2007:7) found that the breaking down of the barriers between schools and rural communities can 'encourage inter-generational learning and relevance of the curriculum to the needs of rural people'. He shows that the outward movement of school knowledge can also occur – 'parents and community members can learn new ideas, methods and techniques from their children and teachers …'; thus contributing to development. The elders in the Nyamakurukuru case claimed to have learnt 'lots', but the scope of this case study did not allow for data collection regarding the outflow of knowledge from the classroom to the community.

The case study did provide an opportunity for three teachers to reflect on the question of community involvement in curriculum. Although still somewhat uncertain as to whether competence exists in the community, the teachers have asked the community to continue their involvement – 'Let us maintain this state where we were not just dependent on the school to teach the children. Let us get rid of the 'go ask your teacher' attitude and all play a part in educating our children' (Nyamakurukuru head teacher, pers. comm., 2006).

Finding 3: Contextualisation allowed formal education to take place outside of the school

The acknowledgement during this case study that learning was taking place outside the classroom – 'The children are learning about their environment in their environment'; and away from the school – 'education is not just inside school' (Nyamakurukuru elder and parent,

pers. comm., 2006) – represents a significant break in the conceptual 'frame' that assumes that education is schooling. In other words, it challenges the conflation of education with schooling to which many governments and educationalists implicitly subscribe. It also disrupts the notion that schooling must take place within the four walls of a building. This is a significant (though not necessarily appreciated as such) demonstration that education does not have to depend on a child's access to a central building. Providing school buildings and ensuring children's attendance at them are challenging issues which dog education providers in wetlands because establishing infrustructure is difficult and children have difficulty travelling. The notion that children can learn away from school could be researched further in terms of a contribution to improving wetland education services.

Finding 4: Contextualisation necessitated a change in pedagogy to more learner-centred, discovery methods

In order to give opportunities for local and indigenous knowledge to enter the classroom, this case study found it necessary to change the pedagogy from teacher-talks-student-listens to one where both students and teachers talk and listen to each other. The three teachers changed their pedagogy to more learner-centred methods. This weakening of the hierarchy – a weakening of the framing, as Daniels (2001) puts it – enabled the students to be more active, more inquiring and to do collaborative work. Students were encouraged to talk to each other in groups and while on outdoor research assignments, thus providing opportunities for the social learning described by Vygotsky (in Rieber & Carton, 1987) and Wals and Heymann (2004). Also, new voices entered the pedagogic discourse (those of the communities, as mentioned above). Students were permitted to be teachers and gave presentations of their findings, from which the teachers and elders learnt.

The teachers participating in this case study also made learning and support materials for active learning which they had not done before, and which is not a common activity in Tanzanian government primary schools (Mrutu *et al.*, 2005). For the first time these teachers used the outdoor environment and the local community as educational resources. This represented a very adventurous breaking of norms by the teachers, 'We have never done this before' (Nyamakurukuru head teacher, pers. comm., 2006) said one teacher who, like most Tanzanian primary school teachers, usually employs teacher-centred, one-to-many pedagogies (Mrutu *et al.*, 2005). The ingredients for a successful change to learner-centred pedagogies which were adequately available during the case study action research period included: teacher enthusiasm, teacher competence, reference resources (some borrowed), compliant students, scaffolding from an outsider, support from the higher authority, support from the school management and the community (Hogan, 2007). As the Nyamakurukuru head teacher indicated: '…[the study] made science ideas seem easier to carry out in practice' (Nyamakurukuru head teacher, pers. comm., 2006).

There were frustrations on the part of the teachers and hesitation on the part of the students in applying the new pedagogies. As was to be expected, it was not a complete change of approach and some norms still persisted even if they were incongruous with the more partnership-type methodology introduced in the case-study work. For example, the continued

presence of corporal punishment was incongruous with encouraging participation. While learner-centred pedagogies were taking place in the COBET classroom, the overall framing of the Nyamakurukuru school organisation continued elsewhere in the school as part of its 'implicit' curriculum (Eisner, 1985); examples of which include the marching drills and formal salutations to teachers. The teachers also did not feel that they had adequate training and resources, and they indicated that more preparation and small classes were needed for using learner-centred approaches (Hogan, 2007).

Finding 5: Contextualisation allowed for indigenous knowledge to come into the classroom

The subject chosen for the case study – *Maarifa* (General Knowledge) – in the COBET system is less classified in terms of its knowledge than other subject categories of the main primary school curriculum; meaning that it is not in a language that is insulated from other subjects, but rather allows a multidisciplinary approach and invites a variety of epistemologies.

This action research allowed for the students and the community members to also be teachers; thus their knowledge, which is local and indigenous, was explicated because the pedagogy provided opportunities for it. Box 1 demonstrates the way in which an elder was facilitated to teach about mushrooms and how 'book' knowledge about mushroom propagation (seeds versus spores) was mixed with local knowledge.

Box 1. Community gets voice as a teacher and knowledge mixing is facilitated

Head teacher: 'You mentioned that mushrooms are available in the wet season. Are they really here? I seldom see them.'

Mama Mkumbenda, an elder, explained that mushrooms occur only in special places like under mtondo or mpandapanda trees.

Head teacher: 'So since the loggers are removing most of these trees, we will have no mushrooms left?'

Mama Mkumbenda: 'There are three main types of mushrooms 1. *Ligululwa* 2. *Lipoa* (white, big and flat) and 3. *Utembo* (easy to dry). You boil them a bit and then dry them.'

Female member of the school committee: 'And do mushrooms have seeds?'

I explained about the spores and how to see them when the mushroom is ripe.

Head teacher: 'Why don't we see them in the markets? I know a man who grows them and sells them in Dar es Salaam for a high price, why can't we make money from them?'

Male elder from the village: 'We need to find markets for them.'

The weakening of the framing also facilitated the weakening of the classification of the knowledge so that merging of book knowledge, teacher knowledge, students' knowledge and several different community members' knowledge took place. O'Donoghue *et al.* (2007) witnessed a disregard for the dialectic classification of indigenous and scientific knowledges. However, this study noted some differentiation between local knowledge and other knowledge, as shown in the following vignette drawn from observation data in the study:

Head teacher: 'Are those local names and does anyone else understand them?'
Male elder from the village: 'These are the names we use and even the loggers' agents understand these names, but they sometimes have other names as well.'
Head teacher: 'I suppose it is good to know the local and the scientific names so that we can all understand each other.'

This mixing of epistemologies provides for the reappropriation of the rich heritage of indigenous knowledge which has 'intrinsic efficiency and efficacy' to complement 'the western framework' and to once again provide 'cultural reference points' in tackling the issue of sustainable development and human poverty that Odora–Hoppers (2002:11) desires. It is the type of scholarship 'that combines indigenous knowledge with external knowledge at a collegial level' and which 76 African delegates proposed at a conference in Ghana (Millar *et al*., 2006:171) and which is endorsed by UNESCO (UNESCO, 2006). For such a mix of epistemologies, teachers need to recognise the value of school-home-community relationships and community members need to appreciate that their knowledge has value. Such dynamics were witnessed at Nyamakurukuru.

Finding 6: Contextualisation stimulated creativity and increased confidence
Both teachers and students responded creatively to the weakening of classification and framing which the contextualisation process facilitated. During the pre-lesson contextualisation workshop the teachers had creative suggestions – 'We have lots of learning support tools like the map and the aerial photo; let us discuss how we can use them for learning about seasons.' – and also made a rain gauge and a water cycle experiment from plastic bottles and local materials. Drawing freehand was encouraged in the children's graphic presentations of the data they had collected from the community members. These and other creative responses seen during the study concur with Daniels' (2001) findings for schools in England where a weakening of classification and framing nurtured students' capacity to be creative and to make choices. Creativity is seen as a crucial skill for getting out of the 'prison for the imagination' in which the existing language of sustainability binds us (Adams, 2006:14). Creativity, visioning, re-imagining the world and critical thinking are seen as essential to good environmental and sustainability education (Carlsson & Bruun-Jensen, 2006; Jickling, 2005; Le Grange & Reddy, 2007; Wals, 2007).

Students' confidence improved as a result of the learner-centered and discovery pedagogy. Table 1 shows the analytical memo on learner participation and responses which summarises the comments, opinions and issues arising in relation to this category of analysis. An example was the increase in participants' confidence to make presentations in public at the end of the process compared to the first time they tried it. This concurs with Bruun-Jensen's (2002) suggestion that empowerment/increased confidence can arise from appropriate teaching-learning techniques that make the curriculum relevant to the child's environment. This was done by providing active learning opportunities to engage the learners in researching indigenous knowledge from resources in their locality.

Official sanction for the weakening of the distinction between academic subjects and between the power positions of the players in formal schooling is found in the COBET curriculum, but such weakening is not yet common in Tanzanian schools.

Finding 7: Contextualisation brought local socio-political environmental issues into the classroom

Another change in content was that local socio-political-economic environmental issues, including the control of forest logging and the marketing of mushrooms, were discussed in the classroom setting, indicating a shift in power relations at Nyamakurukuru. The penetration of such issues into formal education provides openings for students to get the 'insight and knowledge' and 'social skills' needed for their engagement in 'concrete action' with their communities *for* the environment as discussed by Carlsson and Bruun-Jensen (2006:241).

Conclusion

While this study only focused on one case, it provided useful insight into some aspects of curriculum contextualisation, as discussed above. In engaging the interacting dynamics of relevance through efforts to contextualise the curriculum and draw on local cultural knowledge in teaching a module, the education of the youth living in the wetlands was qualitatively changed and improved (Hogan, 2007), although no in-depth or longer-term impact assessment or evaluation has been done. From the evidence presented in this study, however, it could be proposed that the contextualisation process contributed to the achievement of greater educational quality in the context of the objectives of the COBET curriculum module, and the lives of the learners in the wetland, particularly in terms of quality education criteria that focus on relevance, meaning-making and epistemological access (Barrett et. al., 2006).

Notes on the Contributor

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Environmental Sustainability and Quality Education: Perspectives from a community living in a context of poverty

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Abstract

This paper presents perspectives on sustainability, quality and relevance of education found in a resettlement community in Zimbabwe. The exploratory research triangulated data from community meetings, interviews, focus group discussions and digital photography. The results showed that the community lived in a context of risk and vulnerability where a range of economic, cultural, social and environment issues and poor quality of education posed a threat to the quality of life. Tensions in the community and between the school and community, lack of solidarity, and the weakening of the traditional Unhu/Ubuntu *moral and ethical framework contributed to the community's failure to envision and implement interventions towards quality education and towards sustainable development. The participatory research helped ease these tensions, enabling it to realise opportunities to deal with some of its sustainability issues. It enhanced teacher–community relations, leading to cooperation and solidarity around school improvement and environmental projects. The case study demonstrated the relevance of environmental education and education for sustainable development to quality of formal education in the school community and to the quality of formal and informal education in the broader community context.*

Introduction

> *The poor are both the victims and agents of environmental change.*
> (Chenje, Sola & Palecny, 1998:64)

> *Poverty, environmental degradation and despair are destroyers of people, of societies, of nations.*
> (Powell, 2002:online)

As indicated in the quotes above, the poor are said to be both the victims and agents of environmental damage and that poverty and environmental degradation have the potential to destroy people and societies (Chenje, Sola, & Palecny, 1998; WSSD, 2002). Given these insights, re-orienting education towards sustainable development involves significant efforts to empower the poor by paying due attention to the quality and relevance of education, a point of conflation in strategic frameworks of the New Partnership for Africa's Development (NEPAD), the African Union, and the Southern African Development Community (SADC) (UNESCO,

2006a). Education of good quality and that is relevant empowers people, including the poor, to meaningfully act on the challenges posed by vulnerability and risk and their sources (UNESCO, 2006). As described in the discourse around the United Nations Decade on Education for Sustainable Development (UNDESD), re-orienting education policies towards Education for Sustainable Development (ESD) is a necessary effort towards this empowerment. According to UNESCO (2006b:5), ESD '… enables people to foresee, face up to and solve the problems that threaten life on our planet. It also means education that disseminates the values and principles that are the basis of sustainable development' (UNESCO, 2006b:5). This research project proposes that re-orienting education theory and practice towards sustainability contributes to quality and relevance of education for all. In Africa, this is a focusing issue for research and development (Lotz-Sisitka, 2006, 2007). In the SADC, the many issues and challenges involving poverty, environmental degradation, increased health risk and food insecurity have been, rightfully, assessed to require an educational response for their alleviation (Lotz-Sisitka *et al.*, 2006a,b,c,d).

Study Purpose and Research Questions

The SADC ESD consultative reports[1] (Lotz-Sisitka et al., 2006a,b,c,d), it emerged that re-orienting education towards sustainable development has potential for being an appropriate response to deal with poverty in society and to enhance potential for realisation of the Millennium Development Goals. This re-orientation could not be effective without researching and interrogating the vexing question of the relationship between ESD and quality and relevance for all in the SADC (UNESCO, 2006b). As a result, the SADC Regional Environmental Education Programme (REEP) facilitated exploratory research on this by providing seed funding to five higher education institutions in five SADC countries. This exploratory research was driven by two needs: (1) to consolidate and strengthen the integration of sustainable development concerns into mainstream education and learning, and (2) to address the major concern of the quality and relevance of education within the UNESCO framework of education for all in its broad sense (Lotz-Sisitka, 2007). The thinking behind this ongoing research is consistent with the need to make a clear case that ESD adds relevance and quality to educational initiatives, since this has been identified as an area of focus for ESD in Africa (UNESCO, 2006a).

This paper presents findings of an open-ended exploratory case study conducted in Zimbabwe. In this case study, people living in a poor resettlement community were engaged to accomplish three things: (1) mapping out environment and sustainability issues and practices, (2) proposing and implementing local educational and development projects to deal with those issues, and (3) mapping out perspectives on quality and relevance of education. This translated into three questions:

1. How does a local community understand and make sense of sustainability and its sustainability issues?
2. What are the perspectives of the local community on how sustainability issues must be addressed in education and in development projects?

3. How does a local community make sense of quality and relevance of education and learning *vis-à-vis* its sustainable livelihood?

In this study, 'community' referred to people and the area in which they live. Focus on quality and relevance of education was reflected in two contexts: the formal education context of the school and the broader social context of the resettled community. Participants therefore included learners and teachers in the school community and people such as parents, community leaders and other members of the broader local community whose children and members were likely to be served by this school. Our use of the term 'school community' is thus with reference to the school and the broader resettled community context.

Research Design and Methodology

The above framing of the research objectives and questions and the fact that the exploratory research targeted people living in the context of poverty, risk and vulnerability, made it imperative to adopt a research design that helped to alleviate these conditions. We were informed by Ruth Bleier (1984, 1986, cited in Lincoln & Denzin, 2000:1117) who postured that social research should be '… driven by an ameliorative purpose; it should seek to solve some problem, to allay some mal-distribution of resources, to meet a genuine need'. In this case study we, as participating researchers, tried to initiate a process of change and transformation, serving to an extent as *animateurs* (Kemmis & McTaggart, 2000).

Given this interest, the researchers socially engaged stakeholders in the community in reflecting upon sustainability issues, sustainability practices, and quality and relevance of education. We assumed that participatory and dialogic processes, when enacted with clear purpose, could raise personal and communal awareness and understanding of sustainable development issues and practices. We assumed too that dialogical approaches, as Bohm (1996) suggests, would enable members of the community and researchers to co-construct and think together, leading to co-learning (Wals, 2007). Glasser (2007:51) suggests that 'co-learning supports change, positive change in particular'. In addition, we assumed that dialogic processes and social engagement (Boothroyd & Fryer, 2004) had the possibility to interface the school system and the community in exploring perspectives on environmental, educational and social problems and their potential solutions. Kemmis and McTaggart explain: '*changing practices is a social process*' (2000:563, emphasis in original).

Data collection procedures

The first stage of exploration involved purposively selecting the community to participate in the exploratory research. Our interest was to locate a poor community that would be accessible to the researchers. A resettlement community in Masvingo province in the south of the country was identified. Masvingo lies in the Save-Limpopo ecological region in Zimbabwe. It lies in agro-regions 4 and 5 that receive a mere 300-600mm of annual rainfall with a 40-45% coefficient of variation (Chenje *et al.*, 1998). High consumption of wood for cooking, heating, and household construction has contributed to depletion of woodland resources, leading to

a 30% wood deficit and high soil erosion rates. In this province, most rural households were either poor (11%) or very poor (63%); only 26% of rural households were 'non-poor' (Chenje *et al.*, 1998). Much poverty was reflected by lack of food security.

The second procedure was an exploratory visit to the community where the lead researcher held a meeting with teachers, toured the school community and took photographs with permission. The third procedure involved three field visits to the school community by the team of researchers. Each visit entailed meeting and interacting with members of the school community, probing individual and group viewpoints on the research focal issues. Members of the community included learners, parents, teachers and community leaders. The school organised a community meeting during each visit. At these meetings learners performed songs, poems, dramas and role-plays whose transcripts depicted their perspectives on environmental, education and social issues.

Community meetings and focus group discussions provided participants with an opportunity to react and to build upon responses of other group members. This proved a good approach, as noted by Wilkinson (2004:181), who explains: 'One or more focus group members may enthusiastically extend, elaborate, or embroider an initially sketchy account.' Kemmis and McTaggart (2000:571) suggest too that 'both the action and the research aspects of action research *require* participation as well as the disciplinary effect of a collective' (emphasis in original). Tours enabled the researchers' opportunities to interact with and observe members of the community's perspectives and sustainability practices. Researchers naturalistically observed members of the community conducting their daily chores and provided complementing feedback. Follow-up visits were made – two between the first and second community visits, and one between the second and the third visit. These follow-ups provided insights into naturalistic life in the community and assured it of the research team's sustained interest in its education and development activities.

The fifth procedure arose out of the observations made during the first visit. The main observations we made were as follows:

- The community school was a satellite school located in an old farmhouse which was in a state of disrepair. The walls were not painted, the windows and doors were missing, and parts of the roof were collapsing.
- The school lacked desks and benches, textbooks and exercise books. Pupils sat on the floor or on stones for lessons. Pupils did not carry books to and from school and did not look well fed or groomed.
- The enrolment of the school was confirmed to be 120 children. Only between 70 and 80 were attending school on the visit. This was attributed to absenteeism and lack of enforcement of school attendance by parents or guardians.
- The satellite school offered classes up to Grade 6. At the end of Grade 6, learners transferred to the parent school to enable them to write the national Grade 7 (primary-school leaving) examinations. Some, as we learnt, simply dropped out after Grade 6.
- Teachers showed high enthusiasm and high expectations for the refurbishment and furnishing of the school, but held little hope of the community making this possible.

- A number of teachers and learners arrived at school late or were absent from school on the first and subsequent visits. All teachers commuted to school; they did not live in the community.

The fifth procedure involved exploring how to motivate agency among members of the community to improve quality. This required an element of advocacy in the research design (Lincoln & Denzin, 2000). The researchers started a 'waste' collection initiative involving discarded computer paper, old diaries, books, charts and models. These were donated to the school, leading to a teacher-led exercise project. This enabled all pupils to have somewhere to write their lessons. Some resource books, 'freebies' and learning resources (charts, games, resource books, information tracts) from the 4th World Environmental Education Congress (WEEC) (2007) as well as a national flag, a football and a netball were given to the school.

In summary, we tried to engage the full range of members of the community. We listened, observed and internalised perceptions, perspectives and the nature of interactions as they played themselves out. This allowed us to learn from the participants and them from us as is necessary in co-learning that is supportive to change (Glasser, 2007). Data collected took the form of field notes, transcripts of children's songs and poems, as well as digital photographs. These were analysed into themes and sub-themes following content analysis procedures (Ryan & Bernard, 2003). The authors (a team of three researchers) agreed on more than 80% on the themes in Table 1 to Table 4, which reflects a relatively high inter-coder agreement.

Results

Being exploratory research, some unexpected results emerged in the course of interacting with members of the community and with teachers and children in the school. First, there was an anticipated level of positive reception of the researchers and the research concept by the community. This is illustrated by participation of parents of both sexes and the community leaders. Second, the community recognised and identified sustainability issues that it initially perceived hapless to deal with. However, in the course of the exploratory research, some practical initiatives were proposed and implemented.

Context and setting of the community

The context and setting seemed to influence perceptions and agency concerning education and sustainability in this community. The resettlement community was located in Masvingo province; that is, in a poor agro-region where household poverty and lack of food security are common (Chenje *et al.*, 1998). The agro-region is vulnerable to droughts and to poor crop yields. A 'resettlement' is a new rural and farm settlement following the Zimbabwe land reform programme in which previously white-farmer-owned land was redistributed to the majority black landless citizens. The community in question is in a former dryland crop farm and ranch that is well endowed in mineral resources, particularly gold. The land pressure was evident from the use of some hillside and rocky areas for plots, crop fields and homesteads. Stream-bed and

stream-bank cropping and gardening was common since the dark clay loams on the banks were richer. Wells dug in the stream-bed provided a source of water for drinking and for the gardens.

Like many other new resettlements, the community was in the process of re-integrating people who previously would not have lived together. It brought together people from communal areas from a number of districts in Masvingo province, political activists, former farm workers, and people who came in to pan for gold. The last of these, colloquially termed *makorongoza*, were 'outsiders' prospecting for gold illegally. Some people were perceived to be social misfits. The community was heterogeneous too in terms of totem, ethnicity and values. Some settlers moved into the re-settlement with family, while others did not. Some had no intention of settling permanently.

In summary, members of the community had very diverse backgrounds and histories. Myers (1999), Netting (1993), and Smith and Williams (1999) postulated that people in new settlements such as this are often isolated from both their families and from the wider social framework of communities which define them. Kinship relationships are vestigial, and traditional values, social norms and family support structures are weakened. The research, in part, explored how this heterogeneity in the make-up of the community influences people's perspectives on sustainability and sustainable resource use and management and on education and sustainable development.

Sustainability issues and perspectives on sustainability

A key focal issue in the research was the question: How does the local community understand and make sense of sustainability and its sustainability issues? Table 1 summarises the perspectives on sustainability issues and its sub-themes. The data show that in this community, sustainability issues were economic, environmental, cultural or social. It is within these dimensions that issues of poverty, risk and vulnerability come to the fore. These factors may be contributing to the community's perspectives and practices, which may lead to more vulnerability to poverty.

Economic challenges were acknowledged in the community. Unemployment and the harsh macro-economic environment forced many people to take up gold panning even though it is illegal. Participation in gold panning threatened food security as families abandoned crop farming and gold-panning activities created open pits that posed a threat to animals and people. The pits also provided additional habitats and breeding facilities for mosquitoes, thus increasing the community's vulnerability to malaria. Small-scale mining and gold panning, stream-bank and steep-slope cultivation, slash-and-burn agriculture, burn-and-hunt practices, veldt fires and tree cutting contributed immensely to land degradation.

Many people perceived that taking panning for gold as alternative economic activity threatened the social fabric, the environment and the health and food security of the community. The causal lifestyles of miners and their associates, due to their real and perceived economic status, created fertile grounding for the spread of sexually transmitted infections (STIs) and HIV/AIDS. Besides this, many people, including 'outsider' gold panners, were not fully committed to settling permanently in this resettlement. Taking responsibility for environmental conservation and management is compromised in such a scenario, as is shown in a study of Cameroonian communities (Ayonghe & Amawa, 2007). When communities are

settled permanently, they view their environment's resources as part of their heritage, making it possible to take responsibility for their sustainable exploitation and utilisation. Non-permanent residency meant that housing structures were temporary and inadequate in number. For example, many homesteads with one or two 'temporary' huts were shared by several members of the family of different ages and both sexes. Where male or female adults, youths and children share sleeping quarters with children of the opposite sex there is high likelihood of sexual exploration and sexual abuse.

Table 1 shows that the community was experiencing sustainability issues that have cultural and social dimensions. The community faced challenges posed by hunger and ill health, including those due to malaria, tuberculosis and other lung infections, and HIV/AIDS. Inadequate clean

Table 1. Observations on the theme 'sustainability issues'

Themes	Sub-themes	Examples Observed or Cited	Stakeholder
Sustainability issues	Economic activities	Farming, small-scale mining, gold panning, *chikorongoza*, sale of fuel wood, hunting, prostitution.	Teachers, parents, community leaders
	Social issues	Poor school attendance, absenteeism, drop-out, old farmhouse school, poverty, hunger, ill health, malaria, tuberculosis and other lung infections, HIV/AIDS, orphans and vulnerable children, child-headed households, poor food security, quelea birds, springbok, hares, child abuse, sexual abuse, prostitution, poor housing, boys and girls sleeping together, idleness/laziness, transfers to distant Grade 7 school, inadequate clean water, hungry and undernourished children, *Havana chokurimisa* (no draught power, seed or fertiliser), changing values, heterogeneous and diverse community, inter-generational marriages (age gaps, early marriage, step-parents, polygamy).	Teachers, parents, pupils, community leaders
	Environmental issues	Land degradation, small-scale mining and gold panning (chikorongoza), stream-bank and steep-slope cultivation, invasive alien plants (*Lantana camara*, Eucalyptus), veld fires, slash-and-burn agriculture, burn-and-hunt practices, poaching, tree cutting, ZESA power outage and fuel wood marketing, Environmental Management Authority.	Teachers, parents, pupils, community leaders
	Cultural issues	Taboo, silence about HIV/AIDS, no cultural, sporting and recreational centre, weak social fabric, weakened *Unhu*, observe *Chisi* (day of rest) on a Wednesday.	Teachers, parents, pupils, community leaders

water supplies and a poor safety net for increasing numbers of orphaned and vulnerable children served to worsen the situation. Due to the impact of the HIV/AIDS pandemic and collapse of the institution of marriage, step-parented and child-headed households were now common. Teachers at the community school estimated that 20% of the children enrolled were orphans. Most were looked after by aged and needy grandparents. The challenges of HIV/AIDS were unlikely to abate due to poverty and due to taboo beliefs that curtailed talking about sexuality and about HIV/AIDS as the cause of illness and death. The casual lifestyles of youthful gold panners and prostitutes aggravated the situation and marriage patterns and other social practices added to the problem. Marriage of young girls to old men (inter-generational marriage), teen marriages and the marriage of young women to men with more than one wife (polygamy) was said to be common. The age gaps resulted in unstable families. The breakdown of marriages or the death of a spouse led to 'step-parenting', under which it was reported that children from a former marriage may be subjected to abuse and neglect.

While the community identified the above sustainability issues, the prevalence of poverty (together with the perceived loss of *Unhu* and the lack of agency) served as serious impediments to act on them locally. The researchers explored the issue of an educational response by exploring their views on quality and relevance.

Perspectives on educational quality and relevance

Table 2 summarises perspectives on the theme 'quality of education'. Issues under this theme manifested themselves under four sub-themes, under which observed conditions implicate

Table 2. Observations made with respect to 'quality of education'

Themes	Sub-themes	Examples Observed or Cited	Stakeholder
Quality of education	Infrastructure	Old farmhouse school in disrepair; no windows or doors; no furnishing; Blair toilet under construction.	Parents, teachers
	Access/ participation	Children looking hungry, dirty, no uniform, no warm clothing, no shoes, no Grade 7, absenteeism, poor retention, high transfer, drop-out, walking distance, satellite school, enrolment 120, composite Grade 4-5 and Grade 0-1, orphans 40-50, children or teachers late to school, assembly 09h00 hours, <80 of 120 learners at assembly.	Teachers, parents, pupils, community leaders
	Learning resources	Few reading and writing materials or books, no books, no pens, walls used for chalkboard work, no charts displayed.	Teachers, pupils, parents
	Teaching staff	Quality of teachers, non-resident in community, commuting, walk to and from school, long distance, poor transport, late arrival, motivation, poor remuneration, supervision, teacher-community relations, absent-sick.	Teachers, parents

poor educational quality. It is important to note the particular perspectives on educational quality and relevance that refer to school-community relationships. These relationships relied quite significantly on teacher-community relations. At the start of the research process, teacher-community relationships were marked by suspicion and tension. There was infrequent contact between teachers and members of the community. Teachers did not live in the community and commuted every day from the city. They did not have other responsibilities at the community level other than their classroom work. As noted in other contexts, teacher-community engagement is desired to promote knowledge, values and action on environment and education for sustainable development issues (Ndaruga & Irwin, 2006).

Table 3 summarises the observations under the theme 'Teacher-community cooperation/ reciprocation'. Under this theme, four sub-themes pertaining to teacher-community relations – community mobilisation, community agency and external agency – have been identified. School-community outreach programmes were absent, but the community suggested adult literacy programmes, women's clubs and community education campaigns could be held at the school. It was acknowledged that education about development projects, HIV/AIDS and environmental issues relating to veldt fires, stream-bank and steep-slope cultivation, tree cutting, and *chikorongoza, which* posed serious sustainability challenges, was necessary.

Table 3: Observations made with respect to 'teacher-community cooperation/reciprocation'

Themes	Sub-themes	Examples Observed or Cited	Stakeholder
Teacher-community cooperation/ reciprocation	Teacher-community relations	High expectations for development of school, 40 parents attended school-community meeting, high expectations for community involvement with school, visit sick and other social activities, attend funerals, interact/work with community.	Teachers, parents, community leaders
	Community mobilisation	Welcoming, local leadership involved, small projects initiated, 40 parents at community meeting, perceived difficult to change.	Teachers, parents, pupils, community leaders
	Community agency	School community meetings, AFM (a faith-based organisation) donated benches, repaired a door and uses school as venue for services; repairs to some windows, fitted chalkboards, brick moulding, toilet construction, garden project, improved enrolment and retention, children not to be home guards, gulley reclamation, exercise-book project, donation of house for teachers to stay.	Teachers, parents, community leaders
	External (researcher) agency	Paper, book, used diary, charts and models collection, 4th WEEC charts, games, resource books, information tracts, national flag, football, netball.	Researchers and donor partners

Tensions in school-community relations showed in the lack of awareness among many parents on what goes on in school and the different perspectives on educational purpose and relevance. Both teachers and learners were frequently absent from school. On the part of learners, absenteeism reflected poor parental supervision and enforcement of regular school attendance, exploiting child labour, and lack of appropriate dress or uniform for school attendance.

Teachers perceived the community to be uncooperative in supporting the development of the school and in supporting learners needs (e.g. fees, books and uniforms). They perceived many parents as not valuing schooling, as it was perceived that people in the community who had money to buy necessities were not highly educated. On the part of some members of the community, the relevance of education was judged according to whether or not someone will be able to make lots of money. Some parents reportedly withdrew their children from school so that they can join them in their different trades, including gold panning and vending. Some parents disapproved of the school tackling themes considered cultural taboos. For example, some disapproved of children singing about HIV/AIDS at the first community meeting.

These tensions eased during the course of the exploratory research. Discussions at the community meetings and children's performances appeared to contribute to this. For example, at the third community meeting, HIV/AIDS awareness poems did not elicit disapproval, as had been evident at the first meeting. Table 4 summarises observations made with respect to the theme 'relevance/value of education'. Responses of parents coalesce around development of academic competencies, while those of teachers and learners focus on social competencies. All three stakeholders identity developing environmental action competency as an important theme for relevance of education.

Table 4. Observations made on the theme 'relevance/value of education'

Themes	Sub-themes	Examples Observed or Cited	Stakeholder
Relevance/ value of education	Academic competency	Develop reading and writing competency.	Parents
	Social competency (life skills)	Children's rights, child abuse, love, peace, care and social relationships; poems on environmental awareness and action, e.g. fighting veld fires and gulley reclamation.	Pupils, teachers
	Environmental action competency/ responsiveness	Gulley reclamation, nutrition, garden, flower beds, water, preventing HIV/AIDS, preventing spread of diarrhoea.	Pupils, teachers, parents

Many parents expressed surprise at the range of socially relevant messages children expressed in drama, poetry, song and role-play at community meetings. Children extolled good behaviour, love, happiness, freedom and *dzidzo* (learning, education). They expressed perspectives on their school and the educational value it added. Pupils expressed a desire for relational attributes, such as love, respect, concern, peace and consideration for others' rights; and for care, protection, and education. Pupils also demonstrated that they were learning useful environmental education

messages including the importance of good conservation and management of the environment, good hygiene and health practices, good farming practices, and the importance of diligence, hard work and responsibility. Learners also pleaded with parents to keep children in school, to respect children's rights, to shun child labour, and to protect children from abuse. In the end, learner, parent and teacher perspectives on relevance of education conflated on promoting positive social competencies. These competences included relationships and life skills. Wals (2007) suggests that educational practices need to promote and engender social relationships. It is in the social relationships that attitudes and perceptions about equality, human rights, respect, and tolerance will be evident.

Implications of the Results and Findings

Influence of context

The exploratory case study demonstrates that particular perspectives on sustainability depend to a large extent on the context and setting in which the issues manifest themselves. In this case, the community was poor and vulnerable. It faced serious challenges attributed to tensions within the community and between the community and the school, which in turn were influenced by macro-level developments. The community school provided formal education of poor quality, yet was relevant in its messages. For example, due to lack of cooperation and reciprocation, parents and community members were not conversant with what school offered to the children and erroneously perceived the relevance of education provided negatively. The community school was not being used a community centre and informal education opportunities were frugal in the community. This contributed to behaviour patterns and practices that were not sustainable. For example, some took up an illegal gold panning. Both gold panning and some farming practices led to environmental degradation that was likely to contribute to further poverty and vulnerability. Many people's reported sexual behaviour was inconsistent with HIV/AIDS preventative measures, increasing risk. The quality of the environment was under constant threat. The quality of formal education in the school was compromised. Informal education opportunities suffered due to lack of solidarity. The perceived lacking solidarity made the community unable to envision development activities and projects collectively. This solidarity and social cohesion was threatened by poverty and by the loss of the traditional ethical and moral framework, *Unhu/Ubuntu*.

The traditional ethical and moral framework *Unhu/Ubuntu* is important when it comes to dealing with educational, environmental and developmental issues in African communities (Mbigi & Maree, 2004). Mbigi and Maree observe that *Ubuntu* is a valuable concept for environment and education for sustainable development and for survival of African communities. Loss of *Unhu/Ubuntu* leads to unsustainable lifestyles and to lack of solidarity and collectivity to explore opportunities to resolve known problems in the community. In our research community, loss of *Unhu* created behaviours and lifestyles that are inconsistent with sustainability and with maintenance of communal institutions such as the school.

Impact of the research on collective agency

Overall, the exploratory research had the catalytic effect in bringing the community and the school together. This it did by facilitating school-community meetings to share perspectives and to learn the reciprocal roles played by the school in the community's development and by the community in the school's development. There was a realisation that the quality of education its children were receiving was below standard and compromised by a number of factors; such as difficulties in getting school fees, a lack of textbooks and exercise books, poor infrastructure, lack of furniture, lack of playgrounds, and a lack of ablution facilities. The learning environment was poor as the old farmhouse school was in state of disrepair. There was a realisation of the need to self-mobilise and to propose and implement school improvement and community development projects. Consensus was reached that such initiatives required positive teacher-community relations and school-community collaboration and solidarity. Improved teacher-community relations and positive interactions were desirable for collaboration in school improvement and for the community to mobilise and implement educational and development projects. The community demonstrated agency by repairing a door and windows of the school building, fitting chalkboards to classroom walls, and by initiating projects involving toilet construction, gardening, gulley reclamation, an exercise-book project, and donation of house for teachers to stay in. There was an acknowledgement of responsibility and agency.

Reflections on the Broader Research Questions

This catalytic research provides lessons leading to the wider, and the grander, of the aims of the SADC REEP's supported exploratory collaborative research in southern Africa. In a Zimbabwe community, the research process was beginning to make a difference. The research instilled a sense of cohesion among teachers and between teachers and the community to work together on the challenges of quality environment, education and development. Together, they began to enumerate, examine and propose practical actions relating to sustainable development and quality education issues. As described above, practical actions that they initiated included: starting an exercise book project, setting up a school nutrition garden, uplifting of the farmhouse school, brick moulding and construction of a Blair toilet.

At meetings, parents listened intently to the recitals by the children, something which they probably were not used to in the past. At the very least, the community meetings provided an opportunity for all to be motivated to learn and act. Finally, it would seem that the research made the community realise that the school could serve as a community centre where positive ideas can be shared and disseminated. Further mobilisation should lead to completion and sustenance of current initiatives and initiation of new development projects, propelling the community towards sustainability and quality, relevant education. In the case of the latter, the community must mobilise to increase teacher-community cooperation and reciprocation. This might help reduce the current reported competition between education and domestic chores. Cooperation has the potential to help to challenge attitudes that promote absenteeism and inadequate prioritisation of children's education. For example, some children miss school to look after the home when parents go to meetings, funerals and other functions. Cooperation

between the school and the community would seem to be a very important way to raise awareness of the value of the immediate and long-term value of education. As observed in this community, curriculum relevance can be increased by examining the local environment and the sustainability issues it poses and presents, and by involving parents in discussing the local sustainability issues. The research framework tried to link educational practices with community efforts to develop. It means that sustainable development activities and goals defined by the community required the support of education. Education and the school curriculum needed to reinforce the community's sustainable development goals. The clearest implication of this exploratory research is that environment and sustainability education can contribute to educational quality and relevance in this community.

Pupils and teachers demonstrated appreciation of the importance of water for life, the importance of a safe and secure environment, the value of respecting others and their rights, the importance of good social relationships, hard work and *Unhu/Ubuntu*, and the value of chastity and freedom from disease and HIV/AIDS and breaking the silence surrounding it. They demonstrated appreciation of the need to contribute and actively implement suggestions for development projects. These are important environmental education and education for sustainable development concepts and practices that have the potential to enhance quality and relevance of learning opportunities – not only for children, but also for members of their community. Creating opportunities to learn environment and sustainability concepts, practices and values has potential to increase the perceived relevance and quality of education. Therefore, this research proposes that there is a case to answer in the affirmative the question: Can we make the case that environment and sustainability education contributes to educational quality and relevance? If the community is aware of environmental and sustainability issues, they can begin to think in terms of 'forever' and make appropriate decisions that map out long-term and stable conditions in their environment. In this case study, environment and sustainability education contributes to the quality and relevance of education, as it addresses issues with which people are concerned. It helps the school community to respond to risk and vulnerability, reflecting upon and re-shaping their own values and attitudes. This helps to develop a sense of empowerment, with some outcomes visible for transforming their community. The '*DESD at a Glance'* document (UNESCO, 2006c) states that 'change towards a better quality of life starts with education'.

In this research, the environment and sustainability issues that the community defined provided opportunities for individuals, the family and the community to personalise and socially situate the meaning of education and of development. For example, if in their everyday lessons (children), work and decisions (the community), they could reflect upon the finiteness of the village and its ecosystem resources and how they must live within these finite limits if long-term sustainable lifestyles are to be realised. On the question of the cause of poverty and of the spread of disease and HIV/AIDS, children and adult members of the community needed to learn in their respective ways (formal and non-formal) and at their level how they may contribute to the problem and to the solutions. This, as shown in this exploratory research, can be accomplished if the school is considered as a community centre *and* a centre of learning, in formal, non-formal and informal ways.

The research suggests a direct link between the provision of environment and education for sustainable development and the quality education imperative. Both environmental education and education for sustainable development discourses aim to improve the quality of life for all, especially the deprived and marginalised. While traditionally environmental education focussed more on restoring biological and ecological diversity and integrity, and the relation to livelihoods and developpent, ESD tackles the problems of poverty and its connection to malnutrition, health, HIV/AIDS, food security and to the fulfilment of human rights, in addition to the focus on ecological relations and livelihoods. Education for sustainable development seeks to avert the unsustainable use and consumption of natural resources that disrupts natural environments and intensifies poverty. Reducing poverty, improving health and maintaining ecological structures is expected to improve quality of life. If central sustainability issues are included as topics in the formal and non-formal education of children and adults, as is the case in the community we engaged, then they would understand and take steps to tackle land degradation, illegal mining, risky sexual behaviours, and the loss of family values and *Unhu*.

As we worked, we also pondered the questions: How do we work with research information and processes to benefit community? What is the practical value of research? In this exploratory research project we explored sustainability issues in a community to identify how the education system is responding and how sustainability issues are defined from the community perspective. The intention was to model a way of mapping sustainability issues and to generate educational responses that take community perspectives into account. During the research process, it became apparent that it was not only an educational response that was needed – rather, collective social action of the community was necessary to address sustainability issues through project work. The scientific basis of the projects needed to be embedded in the curriculum. The research demonstrated, albeit on a small scale, that a stronger school-community interface has potential to have a powerful influence on quality and relevance of education, and on learning about environment and sustainability.

Conclusion

The results presented suggest that it is possible to propose that environment and sustainability education contributes to educational quality and relevance of education for all. The community can be mobilised or can be supported to self-mobilise to work towards the improvement of quality and relevance of education and to transforming quality of life. Education that is relevant and of good quality provided formally through the school and non-formally or informally through community meetings and interactions can lead to the learning values and practices that lead to environmental quality and to sustainability. The research process and results lead to a question for further exploration: How can quality and relevant education for all contribute to environment quality and sustainability in southern Africa? As shown in this research, this may require, at the community level, greater opportunities for sharing and interaction in a reciprocal way among teachers, the school and the community – i.e. greater school-community interface. It may also require opportunities that enable teachers and the community to evolve an understanding of sustainability issues that must be addressed educationally and through

collective social and development projects in the community. It shows too that education should not be narrowly conceived as school-based. The school needs to serve not only as a central place where children and teachers meet; it has to serve a much bigger role. First, it needs to serve as a community centre that is also a centre of learning for all. As such, being a community centre, it must cater also for the adult learning needs of its elder members. The research established that an opportunity exists for parents to meet at the school on the day when the community observes a day of rest, *chisi*. Meeting on such a day would enable teachers and members of the community to share and learn in non-formal ways. As such, the school can become a community centre relevant for community mobilisation and participation (Abiona, 2006), while also attending to issues that improve the quality and relevance of the learning experience of learners in the schools.

Notes on the Contributors

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Endnote

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What Selected Basic Schools in Western Zambia are Best At in Environmental and Sustainability Education

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Abstract

This paper outlines a research project which was conducted on the theme of 'Education for sustainable development: Enhancing quality and relevance of education for all'. The study was part of a partnership of five southern African universities who joined forces in a research programme under the support of the SADC Regional Environmental Education Programme based at Howick in South Africa. The aim of the research programme was to contribute to the debate on how Education for Sustainable Development (ESD) could enhance the provision of quality education for all in southern Africa. This aim was set within the following broad research question: How can environment and sustainability education programmes contribute to the quality and relevance of education for all in southern Africa? Tackled from the perspective of the University of Zambia, the starting point for our research was to acknowledge that many ESD researchers in southern Africa, and possibly elsewhere, needed to develop competence in sustaining the perception that the majority of the region's population had areas of strength which merely needed to be identified and then empowered through research. In this regard, this paper reports on a research project which was configured with this assumption in mind; that is, what selected basic schools of Western Zambia were best at in environmental and sustainability education.

Wider Context of the Research

The research on Education for Sustainable Development (ESD) which my co-researcher and I conducted among three piloting basic schools of Western Zambia (used interchangeably hereafter with Western Province) between 25 and 27 October 2007 was itself part of a partnership with four other southern African universities. The research was influenced by various international, regional and national dynamics.

International and regional dynamics

Within the wider framework of the United Nations Decade of Education for Sustainable Development (2005-2014) the research programme aimed to contribute to the debate on how ESD could enhance the provision of quality education for all in southern Africa. Other international signposts included the role of ESD in contributing to the Millennium Development Goals (MDGs), the United Nations Literacy Decade, the African Union's Second Decade of Education in Africa and the Education for All initiative, as well as other related imperatives (cited in Lotz-Sisitka, 2007)

The research programme also made it clear that researchers needed to contribute to addressing the context of risk and vulnerability as well as that of opportunities facing the majority of the southern African region's population. In this regard, risky issues such as increasing levels of poverty, the HIV/AIDS pandemic, increased environmental degradation as well as issues of water scarcity, climate change and drought were to be tackled. However, perceptions of opportunity (e.g. use of natural resources, new technologies, local problem solving and availability of networking chances) among people needed to be explored too.

Important guidelines for the research programme emanated from the New Partnership for Africa's Development (NEPAD), especially the NEPAD Action Plan on the Environment (2003), the SADC Regional Indicative Strategic Plan (SADC RISPD) (SADC 2003) as well as the African Environmental Outlook (UNEP, 2006) report.

Engagement as a core value for universities

The research project was infused with the assertion by Barnett, Clark and Rees (2001) that even the most sophisticated university would be best advised to seek to deepen and widen its direct engagement with policy-makers, industry and commerce, local communities as well as the wider society. On their part, McDonald and Rotanachai (1994) suggest that there is an additional and less tangible role for universities located in developing-country contexts such as that of Zambia. According to them, universities in developing countries are focal points for science and education, as well as being key catalysts for modernisation and social change. Modernisation in this context means the resilience and adaptability of societies or institutions to survive and sustain themselves in the contemporary world. The term also refers to a situation where a society or institution is at the cutting edge of change, instead of being swallowed up or decimated by change. Universities are often involved in advocating causes, community action and holding an important position of trust in the community. They also have an ethical responsibility to meet community needs. These ideals influenced the interpretive, action-oriented strategic implementation plans (SIPs)[1] proposed for all the three participating basic schools in our research project.

The relatively low status of primary education in Zambia

Historically, primary (basic) education covering grades 1 to 7 in Zambia has suffered low professional status when compared to the secondary (high school) sector. In this paper, the term 'primary school' is used interchangeably with 'basic school'. Morale, incentives and motivation in primary education were generally lower than those in the secondary sector, often prompting talented teachers to abandon primary education in favour of secondary education. Through the three basic schools which participated in our research study, a conscious attempt was made to somehow address the said lowered status of primary education in Zambia, in general, and of primary school teachers, in particular. It was hoped that the full implementation of individual SIPs for each piloting basic school in our study would significantly contribute to a raised professional status of the teachers under discussion.

The intersection between school and university, and the central role of teacher education
Barth (1990) stated that the intersection of school culture and university culture is often a messy and quite lively place. He suggested that a number of issues often arise when schools and universities meet, such as who should decide when research is useful. More importantly, how successful can university academics be with their research in reaching and touching people working in and with schools ? The research we conducted had to grapple with such illustrative issues.

Two principal factors influenced the decision to place primary-school teachers, including their head teachers, at the centre of our research process. The first source related to attempts to raise the professional status of primary-school teachers by actively involving them in the research process. The second factor is contained in the UNESCO's (2005) *Guidelines and Recommendations for Reorienting Teacher Education to Address Sustainability,* which emphasises the central role of teachers in promoting change towards sustainability.

Theoretical Framing of the Research

The three key features described below constituted the theoretical framework for the research project.

Modes of perceiving and researching context
As a starting point to engaging in the research process, my colleague and I took note that, in southern Africa and possibly elsewhere, various modes of perception and, hence, research orientations existed among researchers of ESD, in general, and of the situation facing the majority of the region's population, in particular. We posited that all researchers of ESD and environmental education (EE) needed to develop competence in the four complementary modes of perceiving context illustrated in Table 1. What makes these modes of perceiving context as such is that they are metaphorical interpretations of context (herein used interchangeably with situation and condition). Interested readers are referred to Namafe (2006) for a detailed discussion of the wording 'enemy phenomenon'. Being metaphors, the terms 'enemy' and 'friend' often generate a battery of subsidiary concepts by which they operate and manifest their natures. In this regard, the collection of words in each mode represents subsidiary concepts of the root metaphor which lies deeply hidden. Interested researchers may investigate the collection of words in mode B which does not have words describing it.

The above four modes of perception are complementary, intertwined and inter-penetrate each other. It is very difficult to stay and operate only in one mode continuously. Many EE and ESD researchers have historically been bombarded with mode A; that is, operating under the assumption that the majority of the world's population is characterised by enemy-based conditions of risk and vulnerability. As researchers, my colleague and I suggest that southern African EE and ESD researchers need to take great care that equal stress was placed on the other three modes of B, C and D. In this regard, our research itself was deliberately structured in order to focus on reality as a friendly phenomenon full of opportunities and possibilities (i.e. mode D). We assumed that such possibilities and opportunities for environmental education

Table 1. The four complementary modes of perceiving and researching context

Mode A: Context as an enemy phenomenon This generates concepts such as risk, vulnerability, threat, danger, disaster, pandemic, problem, victim, attack, win, lose, hatred, dominate, etc.	**Mode B: Context as neither enemy nor friend phenomenon** This generates concepts which are the subjects of future research by interested researchers.
Mode C: Context as both enemy and friend phenomenon This generates concepts such as ambivalence, caution, steadfastness, determination against odds, alertness, self preservation, etc.	**Mode D: Context as a friendly phenomenon** This generates concepts such as opportunity, cooperation, mutual respect, partnership, collaboration, reciprocity, care, love, respect, possibility, and so on.

(Source: Namafe & Chileshe, 2007)

and ESD are unbounded and, hence, significantly represented the contextual orientation of our study. Other contextual and conceptual building blocks of our study include those outlined below.

The idea of service knowledge

The research was theoretically guided by the abstract concept of 'service knowledge', which comes from the fusion of 'public service' and 'knowledge' as key attributes under which universities like the university of Zambia operate. Service knowledge as an abstract concept is explained by Namafe (1992:215) as:

> … either a material object (e.g. artifact, technology etc.) or non-material idea (e.g. belief, language, customary laws etc.) or even both, which has already been, or is being, purposely and carefully selected from academic, research or social activity and then processed further in readiness for its immediate or long term public relevance. Service knowledge in this case is conceived to be a product of a highly innovative and imaginative effort aimed at constructing something entirely new from academic, social or research activity which a given community can practically and directly utilise for its requirements.

It is important for readers to keep the above definition in mind because the Sefula SIP for the schools described in Appendix 1 represents the tangible form of 'service-knowledge'. In other words, terms such as 'networking', 'curio shop' or 'display cabinets' appearing under items 1–18 of Sefula's SIP were taken from their social context and applied to a strength in order to create a SIP. Moreover, such a SIP tangibly represents for this study the section which traditional research methodologies call the 'interpretation' or 'analysis of results'. In short, the interpretation of results section is the SIP of this paper. Another vital component of our theoretical framing of the research is the concept described next.

The strengths model

As used in this paper, the concept of a 'strengths model' within ESD is adapted from UNESCO's (2005:70–71) understanding that:

> … in this approach, every discipline and every teacher can contribute to sustainability education … to implement the strengths model. Begin by ensuring that educators and administrators understand the concept of sustainability and are familiar with its principles. Once they understand the concept of sustainability, educators from each discipline can examine the curriculum and school activities for existing contributions to ESD. Next, educators can identify potential areas of the existing curriculum in which to insert examples that illustrate sustainability or additional knowledge, issues, perspectives, skills or values related to sustainability. After identifying existing and potential contributions, leaders can create awareness among the educational community of these contributions to the larger ESD picture. Then, these contributions can be woven together to create ESD programmes that are taught overtly to pupils and students. In this approach, the synergistic strengths of combined educational disciplines can convey the knowledge, issues, skills, perceptions and values associated with ESD … The combined pedagogical techniques and strategies of each discipline also contribute to an expanded vision of how to teach for creativity, critical thinking and a desire for life-long learning – all mental habits that support sustainable societies.

In the above understanding, a strength is considered to be a 'finished product' which a person, discipline or institution already possesses and which merely needs to be brought to contribute to some concerted teaching-learning undertaking with a view to achieving positive synergy. This is how the strengths model would have been used elsewhere. Our own approach in this research was slightly different. Firstly, rather than a teaching-learning undertaking, the strength model in our case was used in a research undertaking. Secondly, it entailed considering a strength as a 'catalytic process' which is not initially developed as a finished product but which calls forth various forms of synergy (e.g. networking and partnership, school-industry business links or research), as depicted in the numbered items 1–18 of the SIP listed at the end of this paper. The idea of drawing on these various synergies was to build on, extend and strengthen the very area of strength so identified in the first place. This is a new, dialectical understanding of the strength model which we brought to bear on our research (Namafe & Chileshe, 2008). In reviewing literature, we did not find what the weaknesses of the strengths model might be.

The Investigation Process

The research problem and purpose of the study

Our study was set within the general context of fostering ESD so that it enhances quality and relevance within all basic schools of Western Zambia. But, as stated in the background to the study, basic Schools in Zambia largely remained untouched by cutting-edge developments in EE and ESD. Many such schools had no idea whatsoever about EE and ESD because they had over the years been teaching environmental science (ES). In this regard, many teachers would tend to consider EE and ESD as irrelevant and adding no quality to their existing educational practice. Such teachers were used to teaching curricula that were compartmentalised, examination-oriented and inflexible (MoE, 2003). In short, many such teachers would tend to

see no value at all in EE and ESD. This was the crux of the research problem regarding EE and ESD in many Zambian basic schools.

Put differently, our research saw great need to institutionalise increased participation of Zambian basic schools and their local communities in the sustainable development of the country in order to alleviate poverty and achieve equitable development. In line with the structure outlined in Table 1, our research approach to engaging basic schools in sustainable development was premised on the fundamental idea that such schools were often surrounded by friendly opportunities of all types and that such schools merely need to identify and access innovatively through their identified areas of strength. For instance, if Sefula basic school choose 'herbs and indigenous foods' as its area of strength, the school may come to discover that there are numerous partners, business firms or networks in Zambia and internationally with which the school could work in order to develop its pupils, teachers and communities. This is the essence of the context of such a school being friendly. The Zambian Ministry of Education seem to have acknowledged this possibility; hence the formulation of guidelines for the localised curriculum for all basic schools (MoE, 2005).

As researchers, we also acknowledged that there was a clear lack of knowledge and understanding of the complexity, depth and breadth of processes required to promote, empower and unlock the potential capacities of basic schools and their immediate local communities in order for them to grow, be sustainable and contribute to the economic growth of Zambia. In our view, the SIP of Sefula basic school illustrated in Appendix 1 embodies the processes cited above. It contains energies focusing on ESD which merely require unlocking through active support and implementation.

In view of the research problem described above, our research sought to address the following broad research question: How can environment and sustainability education programmes contribute to the quality and relevance of education for all in Zambia? The study was guided by the following sub-question: How can we educationally sustain what selected Zambian basic schools of the Western province are best at as a means of mainstreaming environmental and sustainability education in such schools?

The illustrated SIP for Sefula basic school in Appendix 1 addresses this particular question. By actively implementing its SIP, Sefula personnel would, in effect, be mainstreaming environment and sustainability so that such issues are not sidelined or berated as being insignificant. This is what we mean by the phrase 'mainstreaming environment and sustainability programmes'.

Specific research questions of the study included the following: Within their localised context, how could schools of Western Zambia involved in this pilot research make use of their identified areas of strength as entry points to environment and sustainability education in order to:

- Promote cultural traditions relevant to their localities?
- Promote progressivism (i.e. being at the cutting edge of things and current within a globalised setting)?
- Innovate new things or ways of doing?
- Address environmental problems of their immediate localities (e.g. poverty, health issues or destruction of the environment)?

- Establish relationships among all the above four items as a way of promoting the development of the respective basic schools, their local communities and surroundings.

As explained earlier, the above list of specific questions is directly linked to schools operating under mode D shown in Figure 1, where such schools can actually develop themselves under the agency of their strength. Details of how they can develop themselves through their strength are fleshed out in the SIP presented later in this paper. For instance, they may apply to donors to sponsor various aspects of their SIP in line with such donors' interests or financial capabilities. In other words, mode D operating through the SIP is clearly asking for a more active than reactive approach from schools so that they can tap into the numerous opportunities surrounding such schools.

The concepts of progressivism and modernisation as used above are, admittedly, hotly contested. In this study, their meaning refers to schools being drivers rather than followers of change through their identified strength. The concepts also refer to adaptability, where school communities do not rigidly and stubbornly defend tradition even in the face of progressive developments.

Research methodology

In line with the points made in the foregoing subsections of this paper, the general research methodology of the study needed to have the following special attributes which may not be commonly found in many studies. The research methodology of the study:

- Manifestly demonstrated an active engagement of the University of Zambia (UNZA) to the public domain of Zambia's primary education system, widening and deepening the university's level of involvement with the community of basic education in the piloting schools.
- Was practical as well as theoretical, the former implying the requirement to address society's real problems and issues.
- Was focused on mutual gains and equality in partnership between the UNZA, basic educators and their immediate localities.
- Was designed to be modernising and engender social change.
- Should have embodied elements of the mission of UNZA; that is, teaching and training as well as research and public service, on one hand, and that of basic schools who are localising their curricular, on the other.
- Needed to be sustainable in the immediate, short and long term so that it is long lasting.
- Needed to actively involve all teachers, community members and pupils, including head teachers, in the implementation process.

A qualitative research design driven by the 'strengths model' was applied and was, in turn, operationalised through a participatory research approach involving the inter-penetration of the action and interpretive research paradigms. The primary population focus was comprised of all basic schoolteachers of Western Zambia (including head teachers), their pupils as well as

community members adjacent to their respective schools. Only three purposively sampled basic schools participated in the investigation. The schools came from three different zones based on their location in the floodplain, peri-urban and forested upland zones. Schools from these zones included the Lealui (flood plain), Sefula (peri-urban) and Nangula (forested upland) basic schools. What risk and opportunity means in each of these zones would differ from school to school. However, the focus of our study in this case was to explore the type of opportunities which each school could carve out of its identified area of strength.

When a five-member research team (consisting of two university researchers, the provincial inservice provider for basic schools, the caretaker manager of a provincial EE centre and one teacher trained under the SIDA-sponsored international training programme) visited each participating basic school, six steps towards engaging the schools in some discussion were followed. Step one involved official introductions of the research team. Step two entailed interpretation of the 'strength model' by using the indigenous Lozi language of the area. In step three, four discussion groups at each school were asked to critically choose only one area of strength with reasons. Each of the four discussion groups reported what they had agreed upon in step four. In step five, plenary debates and discussions supported by arguments took place regarding what should finally be the one selected area of strength for each respective school. In all cases, such discussions proved to be very heated, critical and sometimes, acrimonious. Democratic casting of votes often helped to resolve the debates. Official closing remarks and charting of the way forward by the principal researcher formed step six. The voting results at each school were as follows:

Lealui Basic School

- Grand workshop (*ndu ya lisebelezo*) – 18 votes
- Clay moulding – 9 votes
- Fishing – 14 votes
- Reed handicrafts (*kuluka miseme*) – 6 votes

Total – 47 votes

Nangula Basic School

- Carpentry handicrafts and artworks – 40
- Agriculture – 23

Total – 63 votes

Sefula Basic School

- Indigenous Lozi foods (*lico za sizo*) – 12
- Mango – 6
- Indigenous Lozi herbs (*milyani ya sizo*) – 8
- Indigenous Lozi foods and herbs (*Lico ni milyani ya sizo*) – 29

Total – 55 votes

As used above, the term 'grand workshop' refers to a large building serving multiple functions at the same time in relation to various flood-plain objects, services and solutions of Lealui basic school. As mentioned above, Lealui basic school is situated in a flood-plain environment.

After the above research findings, each school worked in consultation with researchers from the university to design a detailed and holistic SIP based on their chosen areas of strength as revealed from the votes cast above. Such a SIP represents a tangible form of service knowledge, as defined earlier. The next subsection presents the SIP of Sefula basic school based on 'indigenous Lozi foods and herbs'. The stage of designing SIPs based on their chosen strengths for the three schools goes beyond, and is different from, the usual stage of 'discussion of research findings' common to many research reports. This SIP is something unique developed by the researchers. The idea here was to create something of practical value to the schools in their attempts to implement ESD based on their chosen strengths. Except for the concluding remarks, all the parts below (including the table showing numbered items 1-18) have been taken from the agenda of Sefula basic school. Due to space constraints, it was not possible to include the SIPs of Lealui and Nangula basic schools here. The template and wording of the Sefula SIP is the same as that for the other two schools, except that each school would insert their respective strengths wherever Lozi 'herbs and foods' are mentioned.

The Sefula Basic School SIP

Background

This SIP is set within the Public Service Reform Programme which states that all Zambian government ministries, departments and institutions need to develop strategic plans as a basis for improvement of service delivery. This therefore, represents a significant shift in management styles from reactive to proactive and from short-term to long-term planning.

In the case of Sefula basic school, this SIP is for the school to implement a localised curriculum in EE and ESD focusing on the chosen 'strength of Lozi herbs and traditional foods'. The approach taken in this SIP is educational; that is, involving pupils, teachers and community members as equal participants in developing their locality, while learning about it. By stating that learners are partners with parents and teachers in this situation we refer to the issue of participation. Each of these categories of people is presented with the same freedom and openness to render their respective contributions to developing their school.

This SIP implements policy directives from the Zambian Ministry of Education's (1996) *Educating our Future: National Policy on Education* as well as the Ministry of Education's (2005) *Guidelines for the Development of the Localized Curriculum in Zambia* and the Ministry of Education's (2001) *Teacher's Curriculum Manual*.

Overview of Sefula basic school

Sefula basic school is situated 620km west of Lusaka and 16km south of Mongu town along the Mongu-Senanga road on the edge of the Barotse Plain in the Western Province of Zambia. The school is located in the habitat environment of a typical wetland of the Barotse Flood Plain and the dry forest region (Makanda). Sefula basic school was established in 1885 by Parish

Missionary Society missionaries and is one of the oldest schools in Zambia. It was one of the first schools to introduce formal education boarding for boys and girls and established a teacher training college – today known as the David Livingstone Teachers' College.

Sefula basic school proudly attempts to revive, promote and strengthen the Lozi culture and tradition, which is composed of five main Luyana groups of Subiya/Totela, Nkoya/Mbunda, Makwamashi/Nyengo, Kwandi/Mbowe and the Kwangwa. The Western Province of Zambia has a number of other ethnic groups constituting the Lozi such as the Shanjo, Toka, Luvale, Mbukushu, Lucazi and Chokwe. This SIP draws human attention to the *Luyana/Silozi traditional herbs and foods*. The approach taken to focus human attention on this environmental attribute makes the school the only one of its kind in Zambia (and possibly in Africa and the rest of the world) to consciously bring human attention to this particular cultural attribute.

The vision statement, mission, aims, specific objectives and SIP (Appendix 1) developed by the Sefula school as part of the SIP process listed in Box 1.

Box 1. Sefula basic school

Our Vision

A school community that drives its own sustainable development through the agency of *what it is best at*.

Our Mission

We shall work to ensure that members of the public and communities come to appreciate what our school community is best at. We shall particularly use EE and ESD, working through the identified strength to:

- Promote cultural traditions in the locality of the school (internal factors).
- Innovate new things.
- Modernise our lifestyles and approaches (from external factors).
- Address environmental problems found in the locality of the school.
- Generate positive relationships among the four items stated above.

Aim

The aim of this SIP is to introduce and localise EE and ESD in our school community in a manner which anchors such effort on our identified area of strength; that is, of traditional Lozi herbs and indigenous foods.

Specific Objectives

- To introduce EE and ESD at our school.
- To introduce the concept of 'what schools are best at' in our school.
- To introduce the idea of how to localise 'what schools are best at' in the EE curriculum of our school.
- To generate sustainable development at our school through all the above-mentioned elements.

As shown in Appendix 1, the SIP of the Sefula school is a comprehensive plan covering educational, communication, research, methodology, management and partnership aspects as well as some analytical dimensions relating to the strengths of the school. The plan considers cultural/traditional dynamics as well as progressive/modernising aspects, and relates these to innovation and sustainability and environmental education, providing a complex yet innovative framework for enhancing educational quality. What remains untested at this point, however, is the *actual* contributions of this SIP process to educational quality and relevance. This would be the subject of ongoing research and development work as indicated by the framework of the research programme (as outlined above).

Concluding Remarks

The SIP, as presented in Appendix 1, belongs to what this research terms 'service-knowledge'. Service knowledge involves a lot of innovation and imagination.

As researchers, we noted that each basic school needed to construct for itself a robust SIP (as illuminated in the Sefula school example in Appendix 1) based on what they themselves had chosen as their area of professional and cultural strength. In this regard, we, in our dialogues with the school, built into their strength an assemblage of up-to-date professional processes which have the potential to contribute to sustainable development of the respective basic schools and their immediate localities. A close look at Sefula's SIP reveals processes such as networking, curriculum development, use of display cabinets, curios shops, research, as well as publications, comparative education, audio-visual programmes and so on - all dwelling on the selected strength of 'Lozi indigenous foods and herbs'. These themes (processes) have been purposely and carefully selected and appropriated from their ordinary natures and then processed further in readiness for their practical utility in EE/ESD in the context of the chosen professional strength of 'Lozi indigenous foods and herbs'. It is processes such as these which (we propose) are required to promote, empower as well as unlock the potential capacity of basic schools and their localities in order for them to grow, be sustainable and contribute to the economic and sustainable growth and development of Zambia. At the time of writing this paper in 2008, the head teacher at Sefula basic school had already sent out applications for sponsorship of their SIP. Various potential sponsors will be free to select specific objectives from the SIP for sponsorship in line with their wishes, ability or agenda. They are not required to sponsor the whole SIP in totality if funds do not allow. There are also many aspects of the SIP that can continue without funding. As Sefula basic school implements its SIP it is likely to become more active than reactive, tapping into numerous opportunities at its disposal. This is how Sefula has planned in terms of concrete ideas around its SIP (as illuminated in Appendix 1). Tapping into various sponsors, experts and networking partners brings out the attribute of participation of various actors in the affairs of the school. In that manner, the SIP of Sefula basic school, and indeed those of other schools mentioned above, will become potential sites of research in ESD that is framed within positive metaphors.

Other potential areas of strength (i.e. those strengths voted for by some people, such as 'Mango' in the case of Sefula or 'Clay moulding' in the case of Lealui) have been thought about

too. In fact, in the group debates from each school (except for Nangula) there was a deliberate effort to select an all-embracing strength. For instance, the strength of Sefula embraces all the other items which were voted for by other people. Similarly, for Lealui the grand workshop building will house all flood-plain objects voted for by other people, such as fishing, clay moulding and reed handcrafts. Iitem 16 of the SIP is also specifically oriented towards including the links between the main strength being looked at and other (related) strengths.

The potential exists for the strengths model to be adopted by the Zambian Ministry of Education as a practical tool through which basic schools could localise their curricular. This study has demonstrated that all basic schools in Zambia have the potential to identify and focus on their strengths, a process which simply requires educational competences among environment and sustainability researchers and practitioners to explore them.

In this study, the research project aimed to open the spaces for such work to sustain the best attributes of each school, which will (we anticipate) in turn, integrally sustain relevant cultural traditions, innovation as well as modern ideas and an ability to solve localised environmental problems through the strength. As mentioned above, the outcomes of this process still need to be established through further research. However, this study has set a conceptual framework for future research, and has opened the space for a vision of EE that reaches beyond a dominance of negative metaphors. In short, we are proposing that to use the strengths model within the context of service-knowledge to implement environmental and sustainability education in basic schools anywhere is possible, worthwhile and a way for the future. Further research is needed to reflexively review this methodological orientation. For now, this small scale research is charting a new path for studying questions of quality and relevance in the context of environment and sustainability-related education in southern African contexts.

Notes on the Contributor

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Endnote

1. A SIP is a list of actionable topics addressing sustainability issues which a given school can implement on a long-term basis of, say, five years when this is made possible through funding or other facilitative means.

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Appendix 1. The strategic implementation plan (SIP) of Sefula School

Item	Cultural Tradition	Progressing/Modernising	Innovating	Addressing Local Environmental Problems
1. Educational aspects	• Conduct an in-school intensive training in EE and ESD for all the teachers. • Train all the teachers in action competence for future application to aspects of their chosen strength. • Devise a detailed localised curriculum for the school on Lozi traditional herbs and foods incorporating all aspects of this SIP for use in grades 1-9. • Make each teacher contribute the best curriculum ideas on Lozi herbs and traditional foods based on his/her subject area for a grade level of his/her choice. • Identify people from the community having skills, knowledge, ethical values and language norms on Lozi herbs and foods, and let them contribute to the creation of the localised curriculum. • Devise a staff development programme for teachers, school managers and relevant community members based on Lozi herbs and foods.	• Create a platform where the benefits and positive aspects of traditional Lozi herbs and indigenous foods are disseminated by pupils, teachers and community members to the public. • Empower pupils, teachers and community members through entrepreneurship training (business education) so that they sustain themselves through Lozi herbs and indigenous foods. • Continue raising the awareness of the public on the value and importance of traditional Lozi herbs and foods to the modern life. • Invite institutions outside the school which could benefit from traditional Lozi herbs and indigenous foods to come and see the displayed items in the school.	• Support pupils, teachers and community members to innovate various aspects of Lozi herbs and traditional foods by applying to it any of the following measures: - Modifying the strength - Strengthening it - Questioning the strength - Removing aspects from it - Adding aspects to it - Improving the strength - Changing the strength - Importing elements from…. • Creating the following: - Pupil projects - Teacher projects - Community projects • Creating new aspects of the strength. • Deleting aspects of it. • Creating future vision around the strength. • Creating school competitions around it. • Making the strength enterprising. • Critiquing the inherited perception about the strength. • Ecouraging debate around the strength .	• Make an inventory of local health and dietary problems and then match these to solutions which can be provided by Lozi indigenous herbs and foods. • Pupils, teachers and community members to dramatise problems faced by sellers of Lozi herbs and traditional foods. • Formulate teacher, pupil and community projects of Lozi herbs and traditional foods aimed at sensitising nearby communities on the need to sustainably conserve environments on which Lozi herbs and traditional foods centrally depend.

Item	Cultural Tradition	Progressing/Modernising	Innovating	Addressing Local Environmental Problems
	• Develop and maintain school community relationships based on Lozi herbs and indigenous foods. • Establish a school committee to spearhead the development of Lozi Herbs and Foods.		• Abandoning aspects of the strength. • Replacing aspects of the strength with… • Inviting experts on strength to give a talk. • Researching aspects of the strength.	
2. Display cabinets showing varieties of the strength	• Raise funds to construct durable display cabinets to store Lozi herbs and indigenous foods. • Engage an expert curator to preserve all the collected items on Lozi herbs and indigenous foods.	• Enrich the school collections on Lozi herbs and foods with similar objects and items made for the modern life.	• Mixing local, regional, provincial and global elements.	• List all the known local problems related to Lozi herbs and traditional foods and then investigate varieties of Lozi herbs and traditional foods which could address such problems.
3. Curio shop	• Raise funds to establish a curio shop at the school for Lozi herbs and foods. • Train a curio seller on these items. • Raise public awareness of the curio shop at the school.	• Invite a business education expert to come and train pupils, teachers and community members on how best to market and popularise Lozi herbs and foods.		• Modify, strengthen and improve Lozi herbs and traditional foods in order to export them to places beyond the school and country.
4. Research	• Support teachers, pupils and community members for them to conduct studies on Lozi herbs and traditional foods. • Create a platform where researchers of herbs and foods from other places outside the school and province report their research findings.	• Build the capacity of pupils, teachers and community members to investigate ways and means of penetrating modern markets and people's lifestyles in favour of Lozi traditional herbs and indigenous foods.		• Utilise the internet to enrich aspects of Lozi herbs and traditional foods. • Lobby relevant decision-makers to assist in addressing local problems faced by pupils, teachers and community members in connection with Lozi herbs and traditional foods.

Item	Cultural Tradition	Progressing/Modernising	Innovating	Addressing Local Environmental Problems
	• Encourage teachers to be giving research projects such as homework to their pupils on Lozi herbs and foods. • Investigate local environments which provide Lozi herbs and foods with a view to preserving such environments for future generations. • Conduct a public display to report on research conducted on Lozi herbs and traditional foods to members of the public.	• Strengthen pupils to investigate and take action concerning the use of Lozi herbs and foods in modern living.		
5. Publications	• Source funds to publish teaching/learning materials on aspects of Lozi herbs and foods. • Encourage teachers, pupils and community members to donate and make a sustained collection of publications relating to traditional Lozi herbs and foods. • Make a public appeal to community members of the province and beyond it for them to consider pledging donating publications relevant to Lozi herbs and foods.	• Disseminate the value and importance of traditional Lozi herbs and foods through the production and publication of various teaching/learning materials such as pamphlets, newsletters, handbooks, chats, booklets, etc. • Approach relevant environmental and educational institutions such as ECZ, WWF, PANOS or the CDC in order for them to publish manuscripts on Lozi herbs and foods.		• Devise ways of disseminating Lozi herbs and traditional foods through publications to other parts of the country and beyond. • Investigate and revive lost skills, values and knowledge related to Lozi herbs and traditional foods and then publish teaching/learning materials on them.

Item	Cultural Tradition	Progressing/Modernising	Innovating	Addressing Local Environmental Problems
6. Comparative data with other similar strength	• Identify how Lozi herbs and foods are featured among the five Luyana traditions of the subiya/tolela, the Nkoya/ Mbunda, the Makwamashi/ Nyengo, the Kwandi/Mbowe and the Kwangwa. • Devise ways of disseminating the Luyana heritage on Lozi herbs and foods to communities and the public. • Describe royal approaches and policies to Lozi herbs and foods by the Barotse Royal Establishment (BRE). • Describe royal approaches and policies to Lozi herbs and foods by a nearby royal establishment to the school • Record how local ethnic groups to the school practice the use of herbs and traditional foods.	• Make a collection of data and information printed from any part of the world on indigenous herbs and foods. • Raise funds to invite specialist experts on indigenous foods and herbs from any part of the world to come and share their experiences with school pupils, teachers and community members.		• Promote mutual respect for culture and tradition between the different ethnic groups of Zambia so that they understand each other's values for indigenous herbs and traditional foods (as a way of resolving potential ethnic conflicts).
7. Identifying and promoting unique aspects of the strength	• Identify aspects of Lozi herbs and foods which are only found among the Lozi and nowhere else. • Provide a platform where such unique aspects are disseminated to members of the public	• Conduct an investigation of how indigenous herbs and foods of selected communities outside Barotseland are different from those familiar to Sefula (what makes them unique).		• Identify and make unique aspects of Lozi herbs and traditional foods as a source of entrepreneurship (business) so that they become a way of reducing poverty among pupils, teachers and community members.

Item	Cultural Tradition	Progressing/Modernising	Innovating	Addressing Local Environmental Problems
8. Audio-visual programmes	• Encourage local musicians near the school to compose songs to promote local Lozi herbs and foods. • Raise funds to make a video showing various aspects of Lozi herbs and traditional foods to be used for educational purposes when visitors come to the school. • Make linkages with relevant filming agencies for them to come and film aspects of Lozi herbs and foods to be used for educational purposes.	• Make a collection of musical tapes, videos or documentaries focusing on indigenous foods and herbs from other parts of the world. • Challenge Sefula basic school pupils, teachers and community members to critique the material on the musical tapes, videos or documentaries in relation to their own way of life.		• Make use of the local radio station or Zambia National Broadcasting Corporation to award winners of an essay-writing competition on how Lozi herbs and traditional foods can be used as a means to sustainably conserve and protect the local environment of the school.
9. Eintertainment and celebration	• Support pupils, teacher and community members to freely entertain themselves and the public based on Lozi herbs and traditional foods. • Build capacity for pupils teachers and community members to innovate songs, poems, drama and other forms of entertainment incorporating Lozi herb and foods. • Select one special day in the school calendar to display and celebrate the day of Lozi herbs and traditional foods. • Create a platform for raising pupils' voices on Lozi herbs and foods.	• Challenge pupils, teachers and community members to create things to entertain visitors to the school out of Lozi herbs and foods. • Make links with established local musicians and bands in order to create entertainment based on Lozi herbs and foods. • Raise funds to support the conduct/composure of entertainment.		• Support pupils, teachers and community members to create plays aimed at sensitising nearby community members on dangers of conflicts and negative impacts of neglecting to use Lozi herbs and traditional foods. • Develop plays, drama or poems on actions which must be taken to reduce the negative impact of foreign investment into the Lozi herbs and traditional foods.

Item	Cultural Tradition	Progressing/Modernising	Innovating	Addressing Local Environmental Problems
10. Gift packs based on the strength	• Generate informed debate among pupils, teachers and community members on how best the school could produce gift packs for visitors to the school based on Lozi herbs and foods. • Explore ways and means by which the school could be strengthened in its desire to share gift packs on Lozi herbs and traditional food with visitors to the school.	• Generate debate among pupils, teachers and community members on modernising Lozi herbs and foods in form of gift packs for visitors to the school.		• Provide a platform for pupils, teachers and community members to discuss ways and means of addressing foreign arrivals in the locality of the school who are depleting Lozi herbs and traditional foods.
11. Field trips organised by the school	• Support educational field trips for pupils, teachers and community members for them to exchange ideas on Lozi herbs and traditional foods with other learning institutions within Barotseland and beyond it. • Generate field reports from such tours for storage in the school. • Strengthen the sharing of information from such tours with the rest of the pupils, teachers and community members.	• Capacitate pupils, teachers and relevant community members to undertake field trips to places with similar indigenous herbs and foods within Zambia or beyond. • Invite pupils, teachers and community members from places with similar indigenous foods and herbs to visit Sefula basic school for exchange of ideas.		• Organise a school educational field trip involving pupils, teachers and community members aimed at investigating how other learning institutions outside the school, province or country solve problems related to indigenous herbs and traditional foods.

Item	Cultural Tradition	Progressing/Modernising	Innovating	Addressing Local Environmental Problems
12. Photos of VIPs and other visitors to see the strength	• Officially launch this SIP on Lozi herbs and foods. • Invite relevant high-ranking officials to the launch and take photos of the event for future use by the school. • Make it a practice that all high ranking officers and visitors to the school are photographed and such photos kept in the school.	• Keep a record of photos of high-ranking visitors to the school coming to see Lozi herbs and foods.		• Capacitate one photographer to take photos on various problems surrounding Lozi herbs and traditional foods for the attention of relevant high-ranking officials in the Ministry of Education or beyond it.
13. Networking and partnership	• Identify all relevant public, private or community organisations with an interest in Lozi herbs and traditional foods and apply to networks and partner with them for the mutual benefit of educating pupils, teachers and community members. • Create a twinning arrangement between your school and an international or regional school based on the idea of indigenous herbs and foods. • Fundraise from well-wishers towards the construction of a herbal pharmacy and traditional food centre. • Identify a suitable architect and constructor of such a building.	• Continue making networks and partnerships with learning institutions, public institutions or private institutions who have a keen interest in indigenous herbs and traditional foods.		• Source funds to buy computers which would facilitate internet connections and networking with similar-minded schools focusing on indigenous herbs and traditional foods. • Create partnerships with well-established research institutions such as UNZA, Mwekera Forestry College or other institutions dealing with indigenous herbs and traditional foods so that local problems faced by the school regarding Lozi herbs and traditional foods are mutually addressed.

Item	Cultural Tradition	Progressing/Modernising	Innovating	Addressing Local Environmental Problems
14. Advertisements	• Run regular advertisements on Lozi herbs and foods through the local radio stations, local musicians or print media. • Raise civic awareness about the importance of conserving the environments which provide Lozi herbs and traditional foods through adverts. • Create platform for raising the voices of Sefula local communities, pupils and teachers concerning what they produce in form of Lozi herbs and foods.	• Rely on regular advertisement of Lozi herbs and indigenous foods so that public awareness of the value and importance of the strength is appreciated in modern life.		• Make a list of all problems related to Lozi herbs and traditional foods and then advertise to well-wishers to assist in solving them.
15. School open days	• Display the best traditional Lozi herbs and foods made by pupils, teachers and community members on a school open day. • Invite relevant visitors to the school open day.	• Make regular use of school open days so that pupils, teachers and community members display the best items of Lozi herbs and indigenous foods to the public.		• Establish a special school open day to display all known problems and hardships related to Lozi herbs and foods for the attention of members of the public .
16. Key things centrally affecting strength	• Investigate and identify things on which traditional Lozi herbs and foods centrally depend for their sustenance. • Find ways and means by which such key things could be preserved and protected.	• Conserve key things or environments on which Lozi herbs and traditional foods depend so that they are preserved for future generations.		• Formulate teacher, pupils and community projects to tackle all threats to the sustenance of Lozi herbs and traditional foods.

Item	Cultural Tradition	Progressing/Modernising	Innovating	Addressing Local Environmental Problems
17. Management issues	• Create a policy in the school focusing on traditional foods and herbs. • Make an organisational structure in the school where each and every teacher takes care of aspects of Lozi herbs and foods. • Support continuing professional development of teachers, school managers and relevant community members based on traditional Lozi herbs and foods.	• Conduct regular monitoring and evaluations of the implementation of all aspects of this SIP. • Engage outside evaluators if need be in order to strengthen and improve the SIP.		• Raise civic awareness among key decision-makers regarding problems faced by local dealers in Lozi herbs and traditional foods.
18. School – business industry links	• Create dialogue with relevant business friends and industries around supporting Lozi herbs and foods. • Advocate and source support from relevant business friends and industries for mutual gain based on traditional Lozi herbs and indigenous foods.	• Sustain regular contact with relevant business and industries for the improvement and strengthening of this SIP so that both the school and industry/business firms benefit.		• Invite relevant business houses and industries to your school and then display to them all the known hardships and problems faced by pupils, teachers and community members dealing in Lozi herbs and traditional foods.

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A Bernsteinian Analysis of the Integration of Natural Resource Management in the Curriculum of a Rural Disadvantaged School

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Abstract

Knowledge integration is one of the key principles that underpin curriculum reform in post-apartheid South Africa. One form of teacher support that has been adopted in South Africa is to provide schools throughout the country with samples of pedagogic texts such as curriculum documents and examination exemplars to act as guidelines to teachers as they implement this new curriculum requirement. In the isolated and under-resourced rural schools of South Africa, these texts are the main form of curriculum guidance to teachers. Hence the knowledge integration principles and messages conveyed within these texts are of crucial importance. One contributory factor to the lack of information on knowledge integration at rural under-resourced schools is the lack of simple and effective research tools by which to analyse and compare the extent of knowledge integration within pedagogic texts and classroom practices. This article reports on a Bernstein-informed analysis that was carried out on three different Grade 10 Life Sciences pedagogic texts in order to assess the extent to which they integrate natural resource management (NRM). The study involved the construction of two indicator frameworks as the research tools with which the analysis was conducted. Results from the analysis showed that although the official Grade 10 Life Sciences pedagogic texts contained very high levels of NRM integration, this was not the case for the Grade 10 Life Sciences text that was produced at the school level. The study provides useful insight into curriculum recontextualisation at a rural under-resourced school through the lens of NRM integration within the Grade 10 Life Sciences pedagogic texts. Such insight has the potential to contribute to better curriculum design and implementation strategies to service schools. This will hopefully help to narrow the gap that currently exists between the official and enacted curricula.

Introduction

Knowledge integration is one of the key principles that underpin curriculum reforms in post-apartheid South Africa. This principle has a strong tradition in the field of environmental education, where following the 1977 Tbilisi Declaration, practitioners in the field were encouraged to take an interdisciplinary approach to the field (UNESCO/UNEP, 1978). The principle of integration in environmental education was also stressed in South Africa's White Paper on education which notes that:

> Environmental education, involving an interdisciplinary, integrated and active approach to learning, must be a vital element of all levels and programmes of the education and

> training system, in order to create environmentally literate and active citizens and to ensure that all South Africans, present and future, enjoy a decent quality of life through the sustainable use of resources. (DoE, 1995:18)

As outlined in the Tbilisi Declaration, an interdisciplinary approach to environmental education involves the inclusion of content from various disciplines during the designing and implementation of environmental learning programmes, thus facilitating a holistic approach to environmental education. Ruhinda (2004) notes that in South Africa's most recent curriculum initiative, the National Curriculum Statement, educators are expected to draw on the unique contents of the various subjects under this curriculum, and to provide learners with the knowledge, skills, values and commitment necessary for making informed decisions about sustainable lifestyles. Teachers are also expected to utilise each subject's Learning Outcomes and Assessment Standards to enhance environmental learning in their classroom practices.

Unfortunately, we do not have much information on how this key feature of environmental education curriculum design is being implemented in most of the rural and disadvantaged schools in South Africa. Although some research has been done in this field, most of it has involved isolated case studies, or studies which were incidental to this research focus. However, the few cases that have focused on environmental education paint a somewhat dismal picture of environmental learning in rural schools. For example, in the Learning for Sustainability Pilot Project research, Janse van Rensburg and Lotz-Sisitka (2000) found that the lack of basic knowledge about environmental issues among teachers compromised the quality of their lesson plans. In Ruhinda factors such as lack of funds, relevant educational materials and external support are quoted by teachers as impeding their attempts to infuse environmental education in their teaching practices (Janse van Rensburg & Lotz-Sisitka, 2000). Unfortunately, studies such as these are few, and much of what is taking place with regards to integrating environmental education into the curriculum of rural schools remains under-researched and undocumented.

One major drawback to researching environmental education integration practices at schools is the lack of quality research tools with which to analyse and monitor the integration of environmental education into curriculum documents and classroom-based practices. Ensor and Hoadley (2004) are critical of many of the research tools that have been used so far to research pedagogy in South Africa's schools, describing them as under-theorised and based on preconceived and uninterrogated ideas about pedagogy. These authors call for the development of research tools which are based on strong theory rather than common-sense understanding and judgements on the part of the researcher. If such research tools are made accessible to teachers working in rural, isolated and disadvantaged schools, they can be used to generate data on their own environmental education integration practices. This will go a long way towards filling the void in our knowledge about environmental education integration practices in rural disadvantaged schools. It also has the potential to contribute towards better environmental education curriculum design for such schools, as a result of the insight gained into their environmental education implementation practices. Teachers also stand to gain from professional development gained from working with these research tools, through, for example, action research.

This article reports on a small study which was conducted at a rural school in the Peddie District of the Eastern Cape. The study had three major aims. The first aim was to construct an analytical framework that can be used to assess the integration of natural resource management (NRM) within various pedagogic documents. The second aim was to use this research tool to trace the trajectory of the NRM integration process, starting from the official Grade 10 Life Sciences curriculum policy and following it to its implementation in the Grade 10 Life Science classroom at this school. Overall, the goal of the study was to obtain insight into the environmental education curriculum interpretation and implementation processes as they occur in an isolated rural and disadvantaged Eastern Cape school. Put another way, the study researched the implementation of the environmental education curriculum policy at a rural disadvantaged school through the lens of NRM integration within the Grade 10 Life Sciences curriculum documents and other pedagogic texts. The research aimed to answer the following research questions:

- To what extent does the Grade 10 Life Sciences curriculum integrate NRM?
- To what extent does the Grade 10 examination exemplar papers (Paper 1 and 2) integrate NRM?
- To what extent does the school's end-of-year Grade 10 Life Sciences examination integrate NRM?

Theoretical Framework

This study is based on three ideas of Bernstein (1996), specifically his concept of 'classification', his model of the structure of the pedagogic device, and his theory of curriculum recontextualisation. 'Classification' is one of Bernstein's best known and better researched concepts. He uses this term to conceptualise power relations between different categories within pedagogic contexts – for example, discourses, subjects, practices and spaces. According to him, it is the degree of isolation between the different categories that constitute power relations, rather than their contents. Giving an example of subjects within a given curriculum, Bernstein explains that subjects that are powerful maintain strong boundaries between themselves and the rest of the subjects in the curriculum. As such, they are able to develop and maintain their unique identities and rules. Bernstein calls this 'strong classification'. Weak subjects, on the other hand, are surrounded by weak boundaries which allow cross-exchanges to occur amongst them, which lead to the loss of their unique identities and rules. Bernstein calls this 'week classification'. He proposes a four-point scale by which the degree of isolation between pedagogic entities could be expressed: C++ for very high level of isolation (very high classification), C+ for high level of isolation (high classification), C- for high level of integration (weak classification) and C-- for very high level of integration (very low classification). Bernstein's concept of 'classification' provides a language and lens with which to analyse and describe changes in the organisation of subjects within a given curriculum following curriculum reform, or curriculum recontextualisation processes. It can also be used to analyse power relations between recontextualising agents and agencies.

Bernstein was also interested in the structure of the system that is responsible for the formation and delivery of educational knowledge. He described it as a relay system and coined the term 'pedagogic device' to refer to it (Bernstein, 1996). According to him, the pedagogic device is constituted from three hierarchically related fields. The first field is called the production field, and forms the social space where new knowledge is produced; for example, by universities and private research institutions. From the field of production this specialist knowledge goes to the field of recontextualisation. According to Bernstein, the recontextualising field consists of two sub-fields: the official recontextualising field (ORF); and the pedagogic recontextualising field (PRF). The ORF consists of state agencies and their agents, such as the national and provincial education departments, and the system of school inspectors and subject advisers. The PRF consists of, *inter alia,* university education departments and other teacher training institutions, NGOs, teacher unions, textbook writers and publishers, and writers and readers of academic education journals. Bernstein defined recontextualisation as the process by which educational knowledge is transferred from one educational site to another. Recontextualisation also takes place in the classroom when teachers work with pedagogic texts produced in the ORF and PRF to create their own texts and pedagogic practices. Thus the classroom forms the third field of the pedagogic device, the field of reproduction.

As knowledge is transferred from one educational site to another, it is subjected to differing ideologies, interests and contexts of the agents and agencies who occupy those sites. By the time the knowledge reaches the reproduction field, it differs markedly from what was produced in the field of production. Bernstein posits that between them, the agencies of the pedagogic device, together with their agents, compete for control of the pedagogic device. Whoever controls the pedagogic device gets to determine not only the contents of what is transferred (i.e. the curriculum content), but also the methods by which it is transferred (i.e. theory of instruction) and evaluated (i.e. the assessment systems). Hence the trajectory of curriculum recontextualisation processes, the identity of the different agents and agencies that are involved, the degree of autonomy between them, their underlying ideologies and how these affect the recontextualising process and the final product, should be of concern to curriculum designers, implementers and researchers.

Method

The research process involved the construction of two indicators frameworks as the research tools with which to analyse the extent of NRM integration within three different pedagogic documents. The first indicator framework was used to establish NRM integration within the National Curriculum Statement for Grade 10-12 (General) document, while the second framework was used to analyse both the Grade 10 Life Sciences examination exemplars (Paper 1 and 2) and the school's end-of-year Grade 10 Life Sciences examination paper. The indicators used in the construction of the frameworks were selected on the basis of what were judged to be key criteria of NRM integration within the different documents. These criteria were decided on after careful examination of the above-mentioned documents. For the analysis of the National Curriculum Statement for Grade 10-12 (General) document, the criteria under

which the integration of NRM was analysed were: definition of Life Sciences, purpose of Life Sciences, Learning Outcomes, Knowledge Areas, Assessment Standards and Glossary terms. For the analysis of the Grade 10 Life Sciences examination exemplar, and the school's end-of-year Grade 10 Life Sciences examination paper, the criteria used were: topic on which the questions were based, allocation of marks, illustrations in the paper, investigations in the paper, and the topic of the essay question in Question 4.

For each criterion, one indicator was used to further examine the status of NRM integration. Hence the analysis of the integration of NRM within the National Curriculum Statement for Grade 10-12 (General) document involved a total of six indicators, while that of the Grade 10 Life Sciences examination exemplars and the school's Grade 10 Life Sciences examination paper involved five indicators. Care was taken in the selection of indicators of NRM integration within the documents under study. For example, the indicators had to be relevant to NRM

Table 1. The indicator framework used to analyse the extent of NRM integration within the National Curriculum Statement for Grade 10–12 (General) document

Indicator	C++	C+	C-	C--
Reference to NRM in the Life Sciences (LS) definition	Refers only to LS knowledge – no reference at all to NRM or related issues	Reference to NRM and related issues are implicit	Makes explicit reference to NRM-related issues only	Makes explicit reference to both NRM and related issues
Reference to NRM in the stated purpose of LS	Refers only to living organisms and biological processes – no reference at all to NRM or related issues	Includes implicit reference to NRM and related issues	Includes explicit reference to NRM-related issues only	Includes explicit reference both to NRM and related issues
Reference to NRM in the Learning Outcomes	All refers only to LS – none refer to NRM and related issues	Make implicit reference to NRM and related issues	Make explicit reference only to NRM-related issues	Make explicit reference both to NRM and related issues
Reference to NRM in the Assessment Standards	All refer only to LS – none refer to NRM and related issues	Make implicit reference to NRM and related issues	Make explicit reference only to NRM-related issues	Make explicit reference both to NRM and related issues
Reference to NRM in the Knowledge Areas of LS	All are specific to LS – exclude NRM and related issues	Have topics that relate to NRM and related issues only in a general way	Have topics that explicitly deal only with NRM-related issues	Have topics that explicitly deal with both NRM and related issues
% of terms in the Glossary that are NRM related	All terms are specific to LS – no NRM-related terms at all in the Glossary	% of NRM-related terms is less than 5%	% of NRM-related terms is 5-10%	% of NRM related terms is more than 10%

integration, easy to understand and evaluate, and based on data that are readily available in the documents that were being studied. The status of each selected indicator with regards to NRM integration was determined either qualitatively or qualitatively, depending on the nature of the indicator, and allocated a classification level according to Bernstein's scale – C++ for very strong classification (very low level of NRM integration); C+ for strong classification (low level of NRM integration), C- for weak classification (high level of NRM integration) and C-- for very weak classification (very high level of NRM integration). The indicator frameworks together with the assessment criteria that were used to analyse the extent of NRM integration within the various pedagogic documents are shown in the Table 1 and Table 2. To facilitate comparisons of the integration of NRM between different indicators in a given document, and between the different documents, the results from the analysis were graphically illustrated with the aid of radar diagrams (see Figures 1–3).

Table 2. The indicator framework used to analyse the extent of NRM integration within the Grade 10 exemplar papers, and the Grade 10 Life Sciences end-of-year school examination paper

Indicator	C++	C+	C-	C--
Proportion of questions which refer to NRM and related issues	All questions refer only to LS – no questions on NRM and related issues in the paper	A few questions refer to NRM and related issues (below 5%)	Some questions refer to NRM and related issues (5–10%)	Many questions refer to NRM and related issues (above 10%)
Proportion of marks allocated to questions on NRM and related issues	All marks were allocated to LS – no marks allocated to NRM and related issues (0%)	A few marks allocated to NRM and related issues (below 10%)	Some marks allocated to NRM and related issues (10-20%)	Many marks allocated to NRM and related issues (above 20%)
Proportion of illustrations on NRM and related issues in the paper	All illustrations were specific to LS – no illustrations on NRM and related issues in the paper	A few of the illustrations were on NRM and related issues (below 5%)	Some of the illustrations were on NRM and related issues (5-10%)	Many illustrations on NRM and related issues in the paper (above 10%)
Proportion of NRM-related investigations in the paper	All the investigations were specific to LS – no investigations on NRM and related issues in the paper (0%)	A few investigations were on NRM and related issues (below 5%)	Some investigations in the paper were on NRM and related issues (5–10%)	Many of the investigations in the paper were on NRM and related issues (above 10%)
Nature of essay topic in Question 4	Essay question is on LS only	Essay question refers generally to LS and NRM	Essay question refers implicitly to NRM	Essay question refers explicitly to NRM and related issues

Results

Integration of NRM within the National Curriculum Statement for Grade 10-12 Life Sciences (General) document

Reference to NRM in the Life Sciences definition
Although the definition of Life sciences in this document does not refer specifically to NRM, it refers to the need for learners to develop an '... understanding of the relationship between Life Sciences, technology, environment and society ...' (DoE, 2003:XXX). Using the indicator framework outlined in Table 1, the integration of NRM within this definition was identified as being high and was given the classification value of C-.

Reference to NRM in the stated purpose of Life Sciences
One of the stated purposes of Life Sciences in this document is to '... allow learners to apply knowledge and skills in a way that will lead to a sustainable management of resources and life support systems' (DoE, 2003:XXX). Using the indicator framework outlined above, the integration of NRM with the stated purposes of Life Sciences was identified as being very high and was allocated a classification value of C--.

Reference to NRM in the Learning Outcomes of Grade 10 Life Sciences
The National Curriculum Statement for Grade 10 Life Sciences has three Learning Outcomes (DoE, 2003:3). Learning Outcome 1 (Scientific inquiry and problem skills) expects learning and teaching to focus on '... exploring and investigating environmental, biological ... systems in everyday life using inquiry, problem solving and critical thinking skills.' For Learning Outcome 2 (Construction and application of Life Sciences knowledge), learners are expected to collect and share information and experiences from the world around them. For Learning Outcome 3 (Life Sciences, technology, environment and society), learners are expected to demonstrate an understanding of '... interrelationships of science, technology, indigenous knowledge the environment and society'. None of the Learning Outcomes makes direct, specific reference to NRM. However, NRM-related concepts such as indigenous knowledge, the environment and society are explicitly mentioned. Using the indicator framework outlined in Table 1 above, the overall integration of NRM within the Learning Outcomes was identified as being high and was given a classification value of C-.

Reference to NRM in the Assessment Standards of Grade 10 Life Sciences
Although the National Curriculum Statement for Grade 10 Life Sciences has nine Assessment Standards (DoE, 2003), only one (Assessment Standard 8) was NRM related. For this Assessment Standard, learners are expected to be able to compare and evaluate the uses and development of resources and products and their impact on the environment and society (DoE, 2003). The integration of NRM within this assessment standard was judged to be very high. It was decided to allocate the overall classification value for the Assessment Standards a value of C--.

Reference to NRM in the Knowledge Areas of Grade 10 Life Sciences

The environment forms one of the Knowledge Areas of Grade 10 Life Sciences. Topics under this heading include human influences on the environment, and the management and maintenance of natural resources. Another Knowledge Area 'Diversity, change and continuity' (DoE, 2003) includes topics on biodiversity, its importance, threats and conservation. Using the indicator framework outlined in Table 1, the integration of NRM within the Life Sciences Knowledge Areas was identified as being very high and was given a classification value of C--.

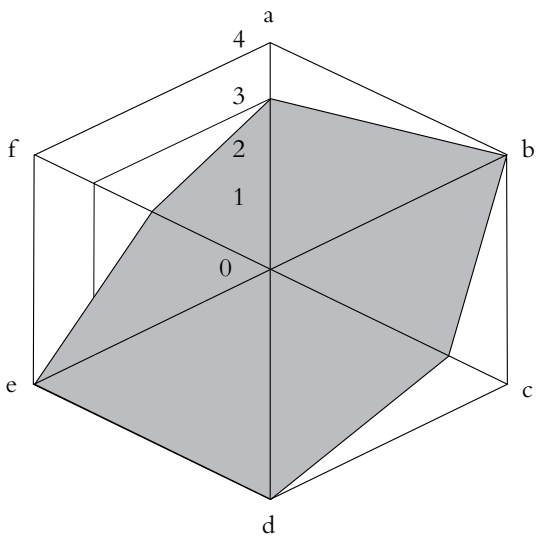
Percentage of terms in the Glossary that are NRM-related

Of the 30 terms in the Glossary, only two were NRM related (7%). The rest of the terms were mostly focused on investigation and the scientific research method. Using the indicator framework outlined in Table 1, the Glossary had a low level of NRM integration and was allocated a classification value of C+.

Synthesis of findings

As mentioned in the methodology section above, radar diagrams were used as a means of representing the findings derived from this analysis. These were used to make the results accessible and easy to interpret and follow. Figure 1 shows the synthesis results on NRM integration in the National Curriculum Statement for Grade 10 Life Sciences document.

Figure 1. A radar diagram illustrating the integration of NRM within the National Curriculum Statement for Grade 10 Life Sciences document



Key to indicators
a - Reference to NRM in the Life Sciences definition
b - Reference to NRM in the stated purpose of Life Sciences
c - Reference to NRM in the Learning Outcomes
d - Reference to NRM in the Assessment Standards
e - Reference to NRM in the Knowledge Areas of Life Sciences
f - Percentage of terms in the Glossary that are NRM related

Key to NRM integration levels
1 - Very low
2 - Low
3 - High
4 - Very high

The Grade 10 Life Sciences exemplar examination papers

The two exemplar examination papers were combined and analysed as one document since analysing them separately would have been repetitious, and analysing them as one document would not have affected the findings in any way. The results were derived from using the analytical tools outlined in Table 2.

Proportion of questions which refer to NRM and related issues

The two examination exemplars had a total of 123 questions between them, of which 19 were based on NRM (15%). Using the indicator framework in Table 2, the integration of NRM within the questions was identified as being high and was allocated a classification value of C--.

Proportion of marks allocated to questions on NRM and related issues

The total marks for the two examination exemplars were 300, out of which 56 marks (19%) were allocated to questions that were NRM related. Using the indicator framework in Table 2, the integration of NRM in the way marks were allocated was identified as being high, and was given a classification value of C-.

Proportion of illustrations on NRM and related issues in the paper

Between them, the two exemplar papers had a total of 13 illustrations, of which two (13%) were NRM related. Using the indicator framework in Table 2, the integration of NRM in the illustrations used in the exemplars was identified as being very high and was allocated a classification value of C--.

Proportion of NRM-related investigations in the paper

The two exemplars contained a total of six investigations, two of which (33%) were NRM related. Using the indicator framework in Table 2, the integration of NRM into the investigations set in the exemplars was judged to very high, and given a classification value of C--.

Nature of essay topic in Question 4

While the essay topic in Paper one was only implicitly linked to NRM, that in Paper two made explicit references to NRM. Using the indicator framework in Table 2, the integration of NRM in the essay topics for Question 4 was identified as being very high, and was allocated a classification value of C--.

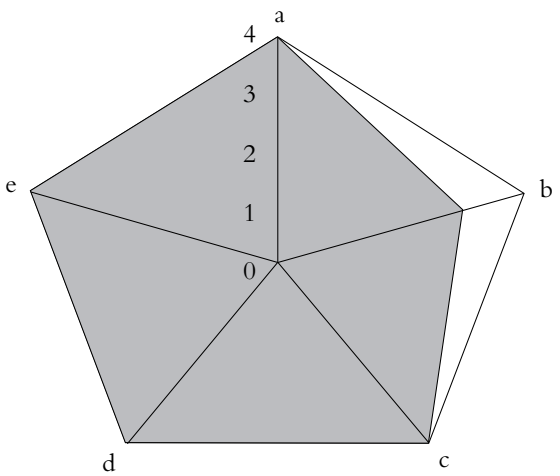
Synthesis of results

The results of this analysis are synthesised in a radar diagram, and are shown in Figure 2.

The school's end-of-year Grade 10 Life Sciences examination paper

The analysis of the examination paper set by the teacher presented a special challenge. First of all, although the National Curriculum Statement for Grade 10 Life Sciences (General) stipulates that there should be two papers set, each two-and-a-half hours long and worth 150

Figure 2. A radar diagram illustrating the integration of NRM within the Grade 10 Life Sciences examination exemplar papers



Key to indicators
a - Proportion of questions which refer to NRM and related issues
b - Proportion of marks allocated to questions on NRM and related issues
c - Proportion of illustrations on NRM and related issues in the paper
d - Proportion of illustrations on NRM and related issues in the paper
e - Proportion of NRM-related investigations in the paper
f - Nature of essay topic in Question 4

marks, the teacher set only one two-hour paper, and it was out of 100 marks. Although both exemplars contained illustrations, investigations and essay questions, the paper set by the teacher had none of these. There was no essay question in Question 4 of the paper. Hence the nature of the paper was such that only two indicators could be applied to the review.

Proportion of questions which refer to NRM and related issues
The paper contained a total of 39 separate questions, all of which were specific to Life Sciences. There was no integration of NRM at all in the questions, and based on the indicator framework in Table 2, a classification value of C++ was allocated to this indicator.

Proportion of marks allocated to questions on NRM and related issues
There being no questions set on NRM or related topics, no marks could be allocated to NRM. Based on the indicator framework in Table 2, a classification value of C++ was allocated to this indicator.

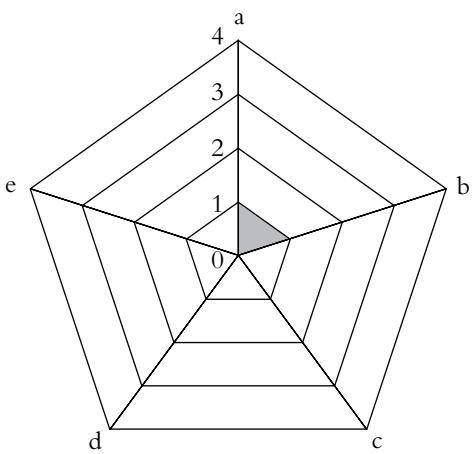
Proportion of illustrations on NRM and related issues in the paper
Since there were no questions based on illustrations in the paper, this indicator could not be used in this analysis.

Proportion of NRM-related investigations in the paper
Since the paper contained no questions based on investigations, this indicator could not be used in this analysis.

Essay topic for Question 4
There was no easy question in the paper. Most of the questions required one word answers, or a single sentence answer. Hence this indicator could not be used in this analysis.

Synthesis of results
As in the previous two analyses, a radar diagram was used to represent the results for ease of access. Figure 3 reflects the synthesis of this analysis.

Figure 3. A radar diagram illustrating the integration of NRM within the school's end-of-year Grade 10 Life Sciences examination



Key to indicators
a - Proportion of questions which refer to NRM and related issues
b - Proportion of marks allocated to questions on NRM and related issues.
c - Proportion of illustrations on NRM and related issues in the paper
d - Proportion of illustrations on NRM and related issues in the paper.
e - Proportion of NRM-related investigations in the paper
f - Nature of essay topic in Question 4

Discussion

The indicator frameworks

The most commonly used approach to determine the extent by which a particular subject is integrated within a curriculum document, is to make the sentence the unit of analysis and compute the frequency of occurrence of sentences which refer to that subject across the entire document (see Bertram 2005; Nsubuga, 2006). This approach could not be used in this study

for the following reasons. The National Curriculum Statement for Grade 10 Life Sciences document is interspersed with material for Grade 11 and 12. In addition, large sections of this document contain information which is not of immediate relevance to the teaching and learning of Life Sciences or NRM. Including such sentences would have introduced a bias in the analysis. Secondly, some of the information in the documents is presented in bullet form, making it difficult to discern where one sentence begins and ends. For these reasons individual sentences could not be used as the units of analysis in this study.

The indicator frameworks proved very useful in providing in-depth tools for analysing integration of NRM within the documents. The key to effective analysis lay in identifying the key criteria of NRM integration within the documents (these differed across documents), and selecting suitable indicators for them. The radar diagrams used to display the results from the analysis are easy to draw and interpret, even for inexperienced researchers. Their other advantage is that they facilitate visual comparisons of NRM integration levels – not only between the different indicators in a given document, but also across the different documents. In addition, areas of NRM integration which need attention can easily be identified from the radar diagrams. However, caution needs to be exercised when drawing conclusions based on NRM integration levels determined from small sample sizes. This was the case for the analysis of NRM integration in illustrations and investigations within the exemplar examination papers which involved percentages calculated from samples of 13 and six items, respectively. However, this was counterbalanced by the larger number of indicators for which NRM integration levels were interpretively determined.

Another challenge was presented where the indicator had different NRM integration values for the same criterion. For example, in analysing the integration of NRM within the Assessment Standards, only one out of nine made a direct reference to NRM. In this case, the overall integration for the criterion was based on the indicator which reflected high or very high levels of NRM integration since this Assessment Standard. Another factor which needs to be considered is the weighting given to different indicators. In this study it was assumed that all the indicators were of equal importance and were given the same weighting. In reality, this is unlikely to be the case. For example, in the examination paper exemplars, the indicators for allocation of marks of to NRM could be seen by some as being more important than the indicator for proportion of questions based on NRM. The weighting of the indicator is one of the early decisions which have to be taken by the researcher who uses this approach. In the case of this study, I chose to weight all indicators equally to avoid an over-complex instrument which would not be accessible to teachers. I also considered that weighting all indicators equally would give a better overall view of NRM integration.

The National Curriculum Statement for Grade 10-12 Life Sciences (General)

The National Curriculum Statement for Grade 10 Life Sciences represents the intended curriculum for this subject. This document was produced by the Curriculum Innovation Directorate, which falls under the Further Education and Training branch of the National Department of Education. These entities fall under the direct control of the state, and their publications on Grade 10 Life Sciences represent the official discourse in this field. Bernstein

(1996) refers to this type of text as the official pedagogic discourse (OPD). With three of the indicators used to analyse this document reflecting a very high level of NRM integration, it can be concluded that the underlying curriculum message in this document supports the integration of NRM into the teaching and learning of Grade 10 Life Sciences.

The Grade 10 Life Science exemplar examination papers represent another form of OPD. The Directorate of Further Education and Training Examinations and Assessment (Schools), which also falls within the national Department of Education, is responsible for producing these exemplars. Their production involved the recontextualisation of the National Curriculum Statement for Grade 10 Life Sciences by officials in this directorate. Following the 2006 introduction of the National Curriculum Statement in Grade 10 in schools throughout South Africa, examination exemplars papers in different subjects have been distributed to schools teaching the National Curriculum Statement for Grades 10-12 throughout the country, as a form of teacher support in implementing the new curriculum requirements. The curriculum messages conveyed within the Grade 10 examination exemplars are supposed to act as guidelines to teachers in their own Grade 10 Life Sciences assessment practices and by default, to classroom practices as well. With four of the five indicators used to analyse the exemplars revealing a very high level of NRM integration, it can be concluded that, like the National Curriculum Statement for Grade 10 Life Sciences, the underlying curriculum message in the exemplars supports the integration of NRM into the Grade 10 Life Sciences curriculum.

The Curriculum Innovation Directorate and that of Further Education and Training Examinations and Assessment (Schools) are not only under direct sate control, but they also fall under the same state department. According to Bernstein (1996), the less autonomy there is between curriculum recontextualising agents or agencies, the less potential there is for changes to the curriculum during the recontextualisation process. The two directorates (who can be described as official recontextualisers working in the official recontextualising field) are under direct state control, and occur within the same department. In Bernstein language, the degree of isolation between the two departments is small: hence the similarity in their underlying messages regarding the integration NRM within the Grade 10 Life Sciences curriculum.

The school's end-of-year Grade 10 Life Sciences examination paper

End-of-year examination papers are part of the enacted curriculum and represent one of the major pedagogic texts produced by teachers in Eastern Cape's rural disadvantaged schools. The production of these texts involves recontextualisation by teachers of the curriculum documents produced in the ORF and the PRF. As noted by Bernstein (1996), the direction taken by the recontextualisation process at the reproduction level of the pedagogic device depends much on the school's context, the teachers' pedagogic practices, and the relationship between the school and the community it serves. Overall, this study revealed that although the teacher had ORF texts which advocated a high level of NRM integration in her possession, she was unable or unwilling to integrate NRM into one of her major pedagogic texts.

Using Bernsteinian language, the 'space' between the ORF texts (produced by the national department of education) and school's examination paper is marked by a very strong boundary, i.e. it is characterised by very high classification. This is due to the isolation between the ORF

and the reproduction field (represented by the Grade 10 Life Sciences lessons at the school). As a result, according to Bernstein, each field develops its own unique 'voice' internal rules and procedures. For example, while the unique 'voice' 'of the ORF emphasises the integration of NRM into the teaching, learning and assessment of Grade 10 Life Sciences curriculum, that of the reproduction field excluded NRM (at least in the end-of-year Grade 10 Life Sciences examination). It is important to realise that for rural schools this isolation is more than the physical distances between the ORF and the reproduction field. Although the physical isolation of the two fields could be playing a key role in determining the final direction of the teacher's recontextualising process (for instance, by hindering the extent by which the teacher's activities in the reproduction field can be monitored), there are other possible forms of isolation that need to be taken into consideration. For example, the isolation could be cognitive, in that the teacher failed to understand the NRM-related messages that the Grade 10 Life Sciences National Curriculum Statement and exemplars were conveying. It is also possible that isolation was resource- or knowledge-based in that the curriculum messages in the ORF texts were based on assumptions about key NRM-related educational resources, skills or knowledge which are not available at this school. The need to understand the interplay between these factors and the curriculum recontextualising process in rural disadvantaged educational contexts cannot be overemphasised. In other words, there is a need to unravel not only the trajectories of the NRM curriculum recontextualisation processes as they occur in rural and disadvantaged education settings, but also the complexities of the contexts under which these processes occur. The insight so gained will contribute to better NRM curriculum design and implementation polices for rural schools. Hopefully, this will go along way towards narrowing the gap that seems to exist between the official NRM curriculum policies and their enactment within rural disadvantaged education contexts.

Notes on the Contributor

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Underlying Mechanisms Affecting Institutionalisation of Environmental Education Courses in Southern Africa

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Abstract

This paper discusses the underlying causal mechanisms that enabled or constrained institutionalisation of environmental education in 12 institutions in eight countries in southern Africa. The study was carried out in the context of the Southern Africa Development Community Regional Environmental Education Support Programme's Course Development Network (CDN). This paper reports on part of the author's doctoral study and draws on critical realism as the ontological lens. Data analysis was done by means of a retroductive mode of inference, as articulated by Danermark, Ekström, Jakosben and Karlsson (2002). The paper demonstrates that there are a number of underlying causal mechanisms, which may enable or constrain institutionalisation of environmental education. They include factors at play at both national and institutional level; namely, responsiveness to national and institutional needs, recognition and ownership, accreditation and certification, institutional culture and politics, short course support structure and support from colleagues. As part of the discussions of the results of the study, I have advanced some retroductive theories that suggest causal mechanisms beyond the empirical data based on the participants' experiences and events in the CDN.

Introduction

This paper emerges from a doctoral study that I undertook in southern Africa in the context of the Southern Africa Development Community (SADC), an intergovernmental organisation whose major objective is to achieve development and economic growth through regional integration. Figure 1 shows the 14 current member countries of SADC.

The study was informed by a desire among environmental educators in southern Africa to exchange information, share good practice and enable collaboration in course development processes. In trying to strengthen the informal networking that has existed in southern Africa for over 15 years, the SADC Regional Environmental Education Programme (REEP) established a formal SADC Course Development Network (CDN) in 1999 with Swedish International Development Cooperation Agency (Sida) funding. The CDN was strengthened with additional funding from Danish Ministry of Foreign Affairs (Danida) between 2001 and 2004.

The doctoral study (on which this paper is based) researched the CDN by investigating how professional development and institutionalisation of environmental education in 12 institutions in eight countries in southern Africa (Zambia, Botswana, Namibia, South Africa, Lesotho, Swaziland, Mauritius and Malawi) could be enabled through networking (Lupele, 2007).

Figure 1. SADC member states

For the purpose of this paper, I will focus the discussion on the probing of underlying causal mechanisms that enabled or constrained institutionalisation of environmental education courses developed by members of the CDN. This is done by providing a brief background to the CDN, assumptions about institutionalisation, the methodological approach and research findings as they pertained to institutionalisation of environmental education in the CDN partner institutions. The findings based on the empirical data are further enhanced by my own retroductive theories.

Background to the Course Development Network

The SADC Regional Environmental Education Support (REES) project was established under the auspices of the wider SADC REEP, with the aim of strengthening processes and capacity for education and training and promoting public awareness in relation to sustainable environmental management in SADC (Carl Bro, 2001). The project was designed to support the SADC REEP's overall objective. Table 1 provides an overview of the composition of the CDN.

The course development process under the CDN involved networking institutions meeting at course development workshops twice a year over a period of 33 months (after the end of the first 33 months, the project was extended for another 12 months). The workshops were structured around six generic issues associated with course development as identified by the CDN members at the network's inaugural meeting in July 2002, namely:

- Curriculum deliberations.
- Course materials development.
- Course delivery strategies.
- Assessment and accreditation of learning.
- Monitoring and evaluation of courses.
- Electronic learning and web-based course design.

Table 1. Composition of the CDN

Partner Institution	Country	Type
University of Botswana	Botswana	University
University of Malawi	Malawi	University
University of South Africa	South Africa	University
University of Swaziland	Swaziland	University
National University of Lesotho	Lesotho	University
Rhodes University	South Africa	University
Mufulira College of Education	Zambia	Teacher training college
National Education Institute of Namibia	Namibia	Curriculum institution
Polytechnic of Namibia	Namibia	Polytechnic
Swaziland National Trust Commission	Swaziland	Government agency
Mauritian Wildlife Conservation Clubs	Mauritius	NGO
Support for Environmental Education in Namibia Project (SEEN) / Desert Research Foundation of Namibia (DRFN)	Namibia	NGO

The courses developed under the CDN were meant to respond to national, institutional, social and ecological diversity. Through these regional workshops, network members shared skills, experiences and resources. Apart from the regional workshops, participants also met in small interest groups that were formed around three major focal areas (according to the courses that were being developed); namely: environmental education for industry, environmental education in formal educational institutions, and environmental education for informal sector such as community-based organisations and NGOs (REES, 2002).

Assumptions about institutionalisation

Part of the rationale behind the establishment of the CDN was to contribute to the SADC REEP aim by supporting environmental education course development processes in the region and, by implication, strengthening capacities and capabilities of institutions and individuals in environmental education processes. This meant that environmental education was made an integral part of the institutions and countries being supported by SADC REEP. The assumption was that this would enhance sustainability of the processes long after the SADC REEP project was over. It was assumed that institutionalisation of environmental education processes would take place in the region as institutions and countries took over and sustained project benefits and activities. However, Schnack, Parker and Squazzin (2004) warn that institutionalisation is not an easy process and needs to be negotiated and implemented within specific institutions in nationally and institutionally specific ways. They argue that there must

be a clear theoretical framework within a host institution, which should be framed by the institution's policy (structure). They suggest that where such policy does not exist or is unclear, the project needs to develop and articulate its theoretical framework. They contend that a clear framework helps host institutions to understand, evaluate and possibly take on board project activities and/or innovations.

Writing in the context of four Danida-funded projects in southern Africa[1], Schnack *et al.* (2004) suggest some broader points which can be drawn on to enable institutionalisation of environmental education in southern Africa. These include political commitment at all levels in the host institution, a post or person designated to the project, collaboration and synergies, recognition of 'invisible work', capacity development, institutional structure and the role conflict.

Methodology and Research Process

The research process was informed by a stratified ontology or view of reality, drawn from critical realism, which argues for the existence of reality independent of human consciousness (Archer, 2003; Sayer, 1984, 2000). Danermark, Ekström *et al.*, (2002) note that critical realism provides an answer to the nature of reality. They argue that there exists both an external world independent of human consciousness, and at the same time a dimension which includes our socially-determined knowledge about reality. In most studies the empirical (what we can experience) is associated with reality (Sayer, 2000). This is based on a positivist assumption that the world happens to correspond with the range of our senses and is identical to what we experience. The stratified ontology of critical realism views the world not only in terms of empirical and actual (as it relates to human) experience, but includes the real (Bhaskar, 1997; Sayer, 1984). Sayer (2000) observes that critical realism distinguishes not only between the world and human experience of it, but between the real, the actual and empirical. The distinction is summarised by Sayer (2000:11–12) as follows:

- 'Real is whatever exists, be it natural or social. Real is a realm of objects, their structures and power. Objects have certain structures and causal powers, which make them, behave in particular ways. They also have causal liabilities or passive dimensions, i.e. specific susceptibilities to certain kinds of change.
- Whereas the real refers to the structures and powers of objects, the actual refers to what happens if and when those powers are activated.
- The empirical is defined as the domain of experience with respect to either the real or the actual. It is contingent (neither necessary nor impossible) whether we know the real or the actual. Rather than relying purely upon a criterion of observability for making claims about what exists, realists accept causal criterion as well.'

Bhaskar (1997) argues that mechanisms, events and experiences constitute three overlapping domains of reality; i.e. the *real*, the *actual* and the *empirical*. This relationship is presented in Table 2.

Table 2. Mechanisms, events and experiences

	Domain of Real	Domain of Actual	Domain of Empirical
Mechanisms	✓	✓	
Events	✓	✓	
Experiences	✓	✓	✓

(Source: Adapted from Bhaskar, 1997)

Through abstraction and conceptualisation, the study sought to understand the relational connectedness of institutionalisation as opposed to finding regularities of what the phenomenon is. Realists believe that explanation of the social world requires an attentiveness to emergent powers arising from certain relationships and to the ways in which the operation of causal mechanisms depend on the constraining and enabling effects of contexts (Archer, 2003; Sayer, 2000). Therefore, the study recognises the crucial role that context plays in understanding and probing institutionalisation of environmental education courses in CDN partner institutions. I am, however, aware that all knowledge is fallible (Sayer, 2000) and so are my claims of understanding the underlying structures and mechanism that enabled or constrained institutionalisation.

Data generation

Data generation for this study started in 2003 and was done over a period of two years during the life of the CDN as a funded project. Data was generated from multiple sources through a variety of methods and techniques. These were mainly;

- Documentary reviews.
- Focus group discussions.
- Interviews.
- Field notes.

During the two-year period of data generation, volumes of data were accumulated. I had a total of 30 in-depth interviews with CDN and SADC REEP members (24) and European environmental education practitioners (6). Besides the in-depth interviews, I carried out a total of five focus group discussions. I also worked with eight latch files of emails from the network members and reviewed SADC REES/REEP documents such as workshop reports (6), evaluation reports of the SADC REEP (3), and inception and operational reports for SADC REES (7). As part of the study, I spent 12 months in the United Kingdom on a Commonwealth Split Site Scholarship tenable at Manchester Metropolitan University. This enabled me to study networks such as the Sustainability Education for European Primary Schools (SEEPS) and Environment and School Initiatives (ENSI), along with other small networks. This process meant that I had to review a total of 12 documents related to the two networks.

The volume of data called for prudent data organisation, as suggested by Burroughs (1975), Stenhouse (1978); and Patton (1990), among others. Drawing on Lotz (1996), I classified the research data into data source folders (DSF) 1 to 6. Each folder was made up of a number of files numerically identified. For example, DSF 1 was for field notes and contained field note files (FN) 1 to 24. To a large extent, the classification of data in folders and data files was a simulation of Microsoft Word computer classification. I found this useful as I could easily relate the hard copies of data to the electronic ones saved on my computer (where these existed).

Data analysis

Traditionally, social science and educational research have relied solely on deductive and inductive methods of data analysis (Ezzy, 2002; Patton, 1990). In the case of this study, I used NVivo computer software to manage inductive analysis of data. NVivo enabled me to reveal the features and relationships in the data in more depth as it allowed me to browse all the data coded at a node, review the data, and return to the context or rethinking the idea (Bazeley & Richards, 2000). Table 3 provides a summary of data analysis by means of NVivo.

Data analysis was further complimented by retroductive inferences. In probing institutionalisation of environmental education courses, I drew more on inductive and retroductive thought operations in line with the critical realist ontology. Categories that emerged from inductive inference, by use of NVivo were subjected to more rigorous examination through retroductive inference. The use of retroductive inference was aimed at 'unearthing' the necessary and contingent mechanisms that presupposed institutionalisation processes. The following question aided the process of retroductive inference: What external and internal conditions enabled or constrained institutionalisation of courses?

In the next sections, I present the results from the participants' diverse views of institutionalisation based on the categories, themes and retroductive inferences that emerged from the analysis of interview scripts, email and members' own reflections as recorded in the regional workshop reports. In this paper, the findings are discussed at two levels – the national and institutional levels.

Table 3. Summary of data analysis process using NVivo

Step	Detailed Analysis
1	Edited transcripts were numerically marked to identity of the interviewees, emails and field notes.
2	Coding of keywords/phrases from each script to get general ideas from the data.
3	Broad-brush coding of each of the scripts
4	Coding by means of main ideas from each of the questions under the broad categories
5	Revising and merging of codes, where appropriate, for consolidation
6	Emerging theory

Institutionalisation of Courses at National Level

Institutionalisation of courses at a national level involves a number of inter-related factors, discussed below. These include a consideration of how the courses address national needs, how responsive the courses are to policy and other national concerns, how stakeholders are involved in the design and development of the courses, and how the courses are recognised within existing national systems. This relates to ownership of the courses, the approval and registration process associated with courses. This, in turn, is linked to the national systems of curriculum development, accreditation and certification.

National needs

This study shows that CDN members set out to develop environmental education courses which responded to national needs. This was evident in the course funding proposals that each member presented to the SADC REES. The national needs included, but were not limited to, environmental policies and environmental education knowledge gaps. Table 4 shows some selected CDN member institutions and excerpts from the course development funding proposals that indicate the national needs to which the courses were responding.

Table 4 also provides evidence that the course developers were conscious of national needs. They aimed to contribute to the changing contexts and needs through the courses they were developing; and took into consideration the policies and needs of their individual countries as far as the role of environmental education was concerned. It would seem that responsiveness to national social ecological needs and priorities played a significant role in the institutionalisation of environmental education courses at national level.

Responsiveness

Institutionalisation at a national level was not much of a problem for members working at university or higher-education institution levels, as they tended to serve national interests. Generally, all they needed in order to achieve the process of institutionalisation was to meet the new course approval systems of their institutions. However, for members who were developing relatively new national courses (such as courses for teachers at national level), often through a government department, they faced additional challenges of meeting national contextual needs. In these cases, responsiveness to national context and needs such as policy and knowledge gaps was said to be key to the acceptability and institutionalisation of the courses.

Policy

Responsiveness to policy reflected the many dimensions of national policy on the environment in the countries. These included responsiveness to the actual legislation on environment, education or environmental education. In some cases, policy included educational curriculum. At policy level, course developers had to carry out a policy review to indicate how the course was responding to policies, as a means of justification. It emerged that government officials in some countries wanted to be satisfied that the course was addressing national policies or that it was making a contribution towards a particular policy. One member recalls what they went through as they were developing their course:

Table 4. Statements from the course proposals that provide evidence that CDN members' courses were responding to national needs

Institution	Statements From the Proposals Indicating the National Needs Being Responded To
Swaziland National Trust Commission (Swaziland)	This proposal seeks to rewrite the course materials in order to incorporate the government priorities in environmental, management, education and conservation. The Swaziland government has developed a Biodiversity Conservation Strategy that focuses on the establishment of conservancies and training of rural communities on how to run these conservancies.
National Institute of Education and Development (Namibia)	Namibia's National Population Policy for Sustainable Development creates an enabling environment framework for environmental education, and declares as one of its strategies: environmental education shall be promoted, with emphasis on efficient management of natural resources at all levels of the educational system as well as in the population at large.
Mufulira College of Education (Zambia)	Zambia Basic Education outcomes-based curriculum integrates cross-cutting issues such as HIV/AIDS, life skills, gender, human rights, reproductive health, good governance, environmental education and water and sanitation. The integration of these issues was done with a view of improving the quality of education in Zambia as defined by the education policy, *Educating Our Future* (1996). In the light of the revised Zambia Basic Education Syllabus, there has been a dire need to incorporate environmental education into the Zambia Teacher Training Curriculum.
University of Swaziland (Swaziland)	Deliberation and consultations leading to the formulation of the National EE Strategy in 2000 raised a fundamental concern that in Swaziland there were no short courses on EE and Environmental Management (EM). Moreover, it was noted that the country lacks a pool of human resource necessary for the implementation of environmental education programmes as well as taking the lead on environmental management issues.
National University of Lesotho (Lesotho)	The government of Lesotho is playing a pivotal role to reorient programmes in various sectors to address environmental concerns. In line with international developments, education has been identified as a key strategy for raising people's awareness about environmental degradation. In this regard, the government is in the process of introducing environmental education in formal education, at both primary and secondary school curricula. This initiative is driven by the Danish supported project, Lesotho Environmental Education Support Project (LEESP). This proposal is intended to enrich teacher education with environmental education by supporting the initiative of the National University of Lesotho to respond to environmental education developments in schools.
University of Botswana (Botswana)	The Government of Botswana has recognised the need for greater emphasis in pre-service and in-service teacher training in environmental education. It has specifically recognised the role that the University of Botswana has in implementing policies relating to environmental education. The Revised National Policy on Education (1964) advocates the introduction of environmental education across the curriculum in the formal education sector.

> *I remember we had to look at the policy books, etc. Then the process was passed on to Curriculum Development Centre, who are the people charged with the responsibility of assuring that curriculum review can start. What I saw was, if the MoE (Ministry of Education), as far as education is concerned, find that the course has no place in their programme or their policy then they does not accept the course.* (Interviewee No. 6)

Some members of the CDN felt that their courses were easily accepted because they were mindful of the question of relevance. They claimed to have always been mindful of the needs of the country as they were articulated in environmental, curriculum and general policy statements, and priorities such as poverty alleviation.

Contribution to addressing the knowledge gap

Besides the policy demands, acceptance of the course as a national programme (as was the case in Zambia and Namibia where courses were developed in government-run institutions) depended on the Ministry of Education or Ministry of Environment's satisfaction that the course was beneficial to the contextual needs and policies of the country. Governments wanted to be clear as to how the course would respond to existing knowledge gaps and capacity building. For example, the knowledge gap and lack of short courses in environmental education, as identified by the National Environmental Education Strategy in Swaziland, seem to have been a justification upon which the course developer drew to have the course institutionalised. Price (2002) confirms that the industry course in Swaziland was identified as a national priority based on the interviews she conducted during the REES consultancy to select CDN partners. She reports that the Director of the Swaziland Environment Authority prioritised the industry course due to Swazi legislation, which classified environmental issues in industry as high priority (Price, 2002).

Another CDN member indicated that only when the government ministries were satisfied that the course met national needs would it be taken as part of the curriculum, as explained below:

> *Possibilities of having the programme … institutionalised lies in the fact that MoE recognises that the programme is beneficial to the country, then they [MOE] take the responsibility and it becomes part of the curriculum.* (Interviewee No. 6)

In cases where the government departments were not clear on the importance or relevance of the course, controlling officers shied away from signing memorandums of understanding (for course development) with SADC REEP. One of the problems of not accepting the course came from a lack of understanding of what the course was about on the part of ministry officials. They were cautious about their involvement and administrative commitments, despite the fact that they had appointed representatives (of their institutions) to the CDN. A number of changes were suggested to the draft course development funding proposals that their officers developed, as this email excerpt indicates:

> *The meeting went fine and it requested that I rework the proposal background and change the target group. The meeting also requested that you come to [country name withheld] and have a chat with the … CEO and Director of Parks.* (Education officer, pers. comm., March 2004).

Stakeholder collaboration

Stakeholder collaboration seemed to have been vital to the process of institutionalisation of the courses at national level. Members of the CDN who worked with stakeholders from other institutions within their countries seemed to have had their courses easily accepted. Involvement of other stakeholders enabled the courses to attain national recognition, as was the case in Mauritius, Swaziland, Lesotho and Zambia. For example, in Mauritius, apart from working with the Ministry of Education, the course developer worked with stakeholders from three parastatal bodies – Mauritius College of the Air, Mauritius Institute of Education and the University of Mauritius. The course developer also involved teachers and other volunteers. This gave the course a national profile, as many institutions knew about it. Involvement of stakeholders in the process of course development seemed to have had a bearing on the institutionalisation of the course at the institutional level. Meetings involving people from outside the institutions gave credibility to the courses under development.

Institutionalisation of Courses at Organisational Level

Although institutionalisation of environmental education courses at organisational level was viewed differently among CDN members, general understanding was expressed in aspects such as owning the courses, recognising the courses, taking responsibility for the courses and enabling continuation. Again this involved issues of approval and registration of courses, consideration of the curriculum development processes and structures at organisational level, and issues of accreditation and certification, all of which are discussed in more detail below.

Recognition and ownership of courses

Recognition and ownership of a course developed under the CDN was seen as key to institutionalisation. Participants understood a course to be institutionalised when a university or institution of learning took it on as an integral part of its own programmes. During a focus group discussion, CDN members seemed to agree that institutionalisation meant that a course (developed under the CDN framework) becomes a property of the institution in which it is run and the institution owns copyright of the materials. The participants seemed to suggest that when a course is said to be institutionalised, it ought to be incorporated in the institutional course programme and lead to some qualification. It was suggested (for example, by interviewees 8, 12 and 22) that recognition and ownership is exhibited by the institutions' willingness to approve and register, accredit and provide certification for the course, like any other courses run within the institution. While recognition and ownership of courses seem to have been less problematic with universities and tertiary education institutions, they proved very challenging to NGOs and non-traditional institutions of learning such as government departments. This is reflected in the following comment made during a focus group discussion:

Ownership is the major part of it. We are having problems with our course development process because we want the Ministry of Education to have ownership of the course. But they are not really involved in the development process of the course, so it can be very hard to involve the ministry in that aspect and yet that was the assumption at the beginning. It is a lot more difficult for the NGO or project of some sort to start a course and then expect it to be taken over by someone, if this other institution has not been involved from the very start.

Approval and registration

Three of the 13 courses developed through the CDN were approved and registered as components of fully fledged courses or as stand-alone courses within three different CDN member institutions (National University of Lesotho, University of South Africa and the National Polytechnic of Namibia). Three other institutions (Rhodes University, University of Botswana and University of Swaziland) approved and registered the courses developed and revised the courses (in case of Rhodes University) as short courses under the institutional short course policy. Of the five non-university-based courses, three were accepted into the mainstream education systems in Namibia (two courses) and Zambia. It also seemed that approval of courses developed under the CDN were easy and faster in institutions which were already running similar courses or were contemplating developing courses in environmental education, as the following interview excerpt confirms:

… the faculty had already been contemplating, or shall I say, my department was in the process of introducing environmental education. The network and the introduction of the course, and course material, come in this kind of context, which really was favourable for this initiative. (Interviewee No. 11)

Curriculum structure

In institutions where the curriculum was rigidly structured or had several cross-cutting themes, as was the case in courses developed within the departments of education or environment, introduction of new courses became almost impossible. Asked to explain the challenges he was facing in having the new course accepted and owned by the department of education in his country, an interviewee had this to say: *'I don't know, maybe the problem is that there is a fixed structure within the teacher education diploma course … and it seems like they do not want any new programmes at the moment'* (Interviewee No. 18). Other reasons advanced included the fact that government education departments often had several activities/programmes that were competing for space in the teacher training curriculum and introducing new innovations called for long and often frustrating negotiations. Sometimes they just did not bother to respond to new innovations, especially if these came from outside their management framework.

Accreditation and certification

As was the case in the process of approval and recognition of the courses developed under the CDN, the study shows that there were a number of problems associated with accreditation and certification of courses. For example, local universities seemed not to have entertained

the notion of accrediting and certification courses developed by non-traditional institutions of learning. This was mainly due to the fact that the tradition and culture of universities did not provide for such processes. Furthermore, there were no institutional mechanisms for accrediting and certificating courses developed outside the university.

Although the accreditation and certification did not become an issue among most member of higher education institution, one of the biggest challenges was to make a course a credit-bearing course once it was approved by the institution. One interviewee lamented that, though the course is accredited under the short-course policy and carries the name of the university, it does not have credits and so participants cannot use the course to advance their careers.

Institutional Support

Institutional support was said to play an important role in the institutionalisation of courses developed under the CDN. The research data indicates that institutional support ranged from institutional culture and politics of who is mandated to develop courses, availability of a short-course support structure, support from colleagues and superiors, and institutional commitment.

Institutional culture and politics

It emerged that within university culture and politics, courses are usually developed by 'experts'. In many instances, course development is controlled by rigid administrative structures which spell out the qualifications and procedures of how to introduce a new course. As a result of this, courses developed by 'non-designated' course staff, could not even be tendered through the approval committees. Due to the short time in which the CDN was implemented as a project, approval of courses (within the project life) could not have been possible due to the bureaucracy implied with having new courses approved by various bodies and committees in the institutions. This put the CDN members under pressure as they had to adhere to the timeframe in the Memorandum of Understanding (MoU) signed between WESSA (on behalf of the SADC REEP) and their institutions. It is clear that development of the CDN and the requirement for MoUs did not take into consideration the institutional procedures for approving courses. Some members did not even attempt to submit their courses through the approval committees due to the anticipated length of time the course approval process would take. They, therefore, opted to run the courses as short-term courses, which did not seem to be a problem with most of the universities. Most university CDN partners had support structures such as short-course policies whose aim was to enable the development of short-term courses for professional development. Through such structures, members were able to develop and run courses in the universities.

Short-course support structure

Although some courses developed under the CDN could not be taken on at the same level as degree courses in some universities, they were accepted and became institutional courses under short-course policies and other short-course support structures aimed at supporting

professional development. This was the case in the University of Botswana, University of Swaziland and Rhodes University (although the Rhodes University course had long been institutionally situated, and the CDN just helped to strengthen the course). Short-course support structures such as policies and the establishment of in-service centres for running short courses provided an opportunity for speedy approval and acceptability of courses developed under the CDN. It was argued that in cases where universities lacked a policy or structure that supported short courses, ownership and acceptability of CDN-supported courses became difficult. The following interview statement bears this out:

> *If a university lacks a structure or structures, courses may have difficulties to be accepted … we have the Centre for Consultancy and Training whose main responsibility is to administer short-term courses, which are basically relevant to professional development*. (Interviewee No. 10)

The above observation could not be true in all cases, as exemplified through the situation at the National University of Lesotho, where the CDN course was approved as part of a degree module despite the fact that the university had no history of a short-course policy. Similarly, the University of South Africa course was easily integrated into a course development cycle in the university, as the lecturer concerned was involved in redeveloping a full Advanced Certificate in Education qualification (ACE). She strategically positioned her CDN course development process within the broader process that already had approval within the university course development framework.

Inadequate knowledge of the field of environment education

It was also argued that approval of courses became difficult because some members of the approval committees might not have had adequate knowledge of the field of environmental education. Inadequate knowledge of the field by the approval committees might have led to non-approval (or delays in approval) of good courses in environmental education in some institutions. In some instances, the philosophical orientation of the courses (which was participatory in nature) went against the set standards and traditions of what constitutes a quality course. Some institutions faced challenges of how courses developed with outside support would be administered within a more structured tradition. In many cases, these challenges were further enabled or constrained by the existing internal relationships among colleagues and superiors.

Support from colleagues

The level of involvement of colleagues was cardinal to the institutionalisation of the courses. Data from this study reveals that in situations where the CDN representative involved colleagues the course was easily accepted and owned by the institution. The study also reveals that in order to achieve institutionalisation of the course, one had to solicit support from colleagues by orienting and involving them in the course development processes at an early stage. It was argued that one way of ensuring colleagues are brought on board was for the CDN representatives to constantly brief their colleagues about the activities of the CDN at regional

workshops and on the progress on the particular course. Those who constantly engaged their colleagues seemed to have received support and the courses they were working on became institutionally located. However, in some cases, CDN members had to struggle to try and motivate interest and mobilise support among colleagues. Apathy towards participation in the CDN courses was also attributed to what one participant called 'academic short sightedness or academic jealousy' (Interviewee No. 10).

Support from superiors

Nearly all the CDN members whose courses were accepted and institutionalised seemed to have enjoyed the support of their superiors at the head of department and dean level (in the case of the universities). Non-university course developers also seemed to have been supported by their immediate supervisors, directors or principles of institutions. In cases were the superiors understood and were willing to support the process, the bureaucracy of having new courses approved by the various bodies and committees became the hindrance to institutionalisation. This was attributed to the short time that the project approval demanded, as normal degree courses took much longer to be approved. Due to the urgency and the short time available for course development in the context of the CDN, some heads of department or deans (in university situations) went against established procedures to have the courses approved.

In some cases course developers were not able to have their courses institutionally located due to lack of support from their superiors who seemed not to understand fully what the course was all about. There were suggestions from course developers who faced problems of not being supported by their superiors, that perhaps SADC as an intergovernmental organisation should have stepped in to intervene in such situations to make superiors realise or be more aware that their staff members' course development activities had the blessing of SADC and that the work was very important at regional level.

Discussion of the Findings

In this section, I draw on Schnack *et al.*'s (2004) framework, introduced earlier, to reflect on the structural and agential factors that enabled/constrained institutionalisation of courses under this study.

Political commitment at all levels of the host institutions

In this study, political commitment was captured under the theme 'institutional support'. Two sub-themes emerged from the study: institutional culture and politics, and support from colleagues and superiors. The institutional culture and politics enabled and in some cases constrained the process of institutionalisation of courses. Some institutions had strict policies as to who was qualified to develop courses at a given level. Therefore courses developed by those perceived as 'unqualified' members of staff could not easily be recognised and accepted into the mainstream institutional course development framework. In some institutions, MoUs were not signed on time or at all – a sign of rejection (Price, 2002).

It is also clear from the findings of this study that lack of support from superiors in some institutions was more political than professional. Some course developers managed to overcome the hurdle of not being supported by their immediate supervisors through coercing support from a higher authority by invoking the name and power of SADC.

Post or a person in charge of institutionalisation

From the CDN point of view, the assumption was that the course developer would lead the process of institutionalising the course. This study reveals that a number of course developers had little or no authority to influence institutionalisation of courses. Although Schnack *et al*. (2004) suggest making alterations to the structure of host institutions in terms of job descriptions and procedures in order to enable institutionalisation, this study shows changing institutional procedures and structures of approving courses was not possible in the context of the CDN. The process of institutionalisation was left up to the course developers' mobilisation of their own agency. The study also reveals that although all the participating institutions appointed representatives or endorsed those initially approached by the REES officials, time as a cost on the part of course developers was not factored in. The course developers continued with their normal workloads in addition to the CDN activities. This appears to have had caused role conflicts with the individuals who had to attend to many responsibilities. Conflicting roles of individual course developers made the process of institutionalisation more complex.

Collaboration and synergies

The ability to identify and mobilise stakeholders from within and outside the institution seemed to have helped a number of course developers to achieve institutionalisation of courses. This study shows that course developers who collaborated and created synergies with other similar projects within their institutions or at national level had the greatest chance of having their courses accepted and institutionalised. Collaboration with other stakeholders seemed to have given credibility to the courses developed under the CDN and influenced subsequent recognition and registration. Most course developers worked with an array of experts in the environmental field.

Recognition of 'invisible work'

Under this theme, Schnack *et al*. (2004) postulate that relationships need to be built and trust established within host institutions before projects can operate at their full capacity. They call this 'invisible work', which is often not recorded in the project documentation or reporting, but can be amongst the most important work a project engages in, in terms of its sustainability. However, the CDN did not allow much time for such work – except for a recruitment process by a consultant and the few visits made by the REES Chief Technical Adviser and Director to some institutions. These visits focused on marketing the network and selection of members. Other visits were undertaken by the Dean of the Faculty of Education at Rhodes University as the lead university in the network. These visits seemed to have helped a number of CDN members in the process of institutionalisation of environmental education courses they were

working on. Following such visits, CDN members reported receiving recognition and support from their colleagues.

It would have been desirable to visit and discuss the CDN and its progress with heads of institutions more regularly. Planning this into the CDN process could have helped, especially in cases where individuals were approached by the REES and recruited into the CDN without prior knowledge of their supervisors who only endorsed their representation later. It also appears most CDN members did very little 'invisible work' to negotiate the process of institutionalisation.

Institutional structure and role-play

Schnack *et al.* (2004) note that one of the complicating factors in the process of institutionalisation of ideas/activities is fitting into an institutional structure. This observation is true of the CDN, as this study reveals. Due to the factors such as time and demands of the CDN as a funded project with a logical framework to follow in a given timeframe, most course developers could not even attempt to submit their courses to the relevant institutional approval committees, as they tended to operate within a much longer time cycle than that allowed by the CDN. Course approval processes in most of the higher education institutions was very laborious and could take many years. It was not possible for the CDN to imagine that the approval of institutional structures could be changed. The CDN worked with the existing structures and depended on the course developers' agency to navigate and negotiate the institutional structures for institutionalisation of the courses. This study shows that the short-course policy or structure became the alternative to the long procedures of approving courses in higher education institutions.

Given the above research findings, which are mainly based on the empirical data and participants' own experiences, I advance the following retroductive theories about underlying causal mechanisms that affected institutionalisation of environmental education courses in southern Africa[2]:

- It would seem that in countries and institutions undergoing curriculum transformation, new courses and innovations in course development are more likely to be institutionalised. This was the case in the National University of Lesotho and the University of South Africa.
- It would also seem that countries with greater commitment to democratic processes would be more likely to accept a participatory course than countries with a weak democratic governance record. Although results from the empirical data showed support from colleagues, existence of short-course policies and negotiations with superiors enabled institutionalisation of the courses; no amount of these aspects was going to be helpful if the country was undemocratic. Democratic governance at the level of government is a precondition for the institutionalisation of participatory courses, or processes in general in a country.
- Institutions in countries at the top of the power hierarchy in the SADC region (such as those in South Africa) are perceived to 'set the standards', and have a higher probability of accepting unconventional courses than those in the lower power hierarchy. Countries in the latter catagory are likely to be more reticent when it comes to novel courses, largely due to a desire to be seen to be maintaining standards and a lack of confidence.

- The family symbol is one area that would further enhance the institutionalisation of courses – especially in the SADC region which was marred by years of suspicion and conflict along racial lines under the colonial and apartheid segregation. Every member state and institution would want to show the family unity and solidarity by working together on a regional programme.
- In some SADC countries which have conservative educational systems, novel courses (such as those developed under the CDN) are unlikely to be accepted. This is because curricula and institutional forms in such countries are based on reproductive models, and reproduce intellectual and knowledge creation patterns characteristic of former colonial universities and epistemologies.

Conclusion

This study illustrates that the institutionalisation of environmental education courses is influenced and shaped by several underlying internal and external relations. The study demonstrates that we cannot explain the structural and agential factors that influence institutionalisation by solely depending on empirical and actual data (as it relates to human experience), and that we need to include the real (the structure and power of objects that exists outside human experience). In this study, critical realist ontology presented a useful theoretical and analytical framework which probed institutionalisation of environmental education beyond the empirical observations, experience and actions of those involved in the CDN.

Critical realism, as used in this study, enabled me to probe the underlying mechanisms that enabled or constrained institutionalisation of environmental education courses. The critical realist ontology domains of the empirical, actual and real provided an analytical framework for probing ontological depth. The usefulness of probing such causal mechanisms is that they insist on a different level of action to make things better, and they give us greater understanding of our constraints and enablements. We can only do what we can do, with what we have. Therefore, for some course developers operating in undemocratic environments, no amount of institutional rearranging, or negotiation with superiors, or discussion with colleagues, was helpful in the end. Their efforts went to waste and their courses never became part of the institutional course framework. It might also be useful to know that the regional power balance between countries is significant; perhaps this would suggest a strategy in which top administrators in some countries are shown what the trendsetters are doing, which would reassure them that these courses are not out of line with good regional practice.

Notes on the Contributor

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development, knowledge mobilisation and management through social networking processes. Justin is a well published scholar in the field of environmental education and education for sustainable development. He holds a PhD in environmental education from Rhodes University. Email: lupelejustin@yahoo.com.

Endnotes

1. The four Danida-funded projects were:
   - Regional Environmental Education Support Project (SADC REES)
   - Supporting Environmental Education in Namibia (SEEN)
   - Lesotho Environmental Education Support Project (LEESP)
   - National Environmental Education Project – General Education and Training phase (NEEP-GET).
2. Critical realism allows a researcher to advance such causal mechanisms, even if there are exceptions, since potentials may exist even if they are not yet actualised. The validity of these assertions comes from their ability to explain certain empirical or actual events.

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Exploring Issues of Relevance and Quality in the Context of a University Programme

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Abstract

Quality and relevance in education are important considerations for university programme designs in today's competitive world. A relevant and quality education programme is likely to afford graduates the opportunity to fare well in the local, regional and international market and social environment. This paper draws insights from a mini research project that was conducted at the University of Botswana in Botswana, within a wider, collaborative research effort established amongst five universities in the Southern African Development Community which focused on the links between educational quality and relevance and environment and sustainability education. Other projects in this collaborative partnership focused on school and community links. This paper, however, explores issues of relevance and quality in the context of a university programme on environment and sustainability education. The data for the research was gathered through a questionnaire survey and focus group interviews. The results of the research provide insights into how a research-based course design process could enhance issues of relevance and quality in university education. An analysis of the research data generated in Botswana has revealed that the university programme investigated should emphasise the local context while taking into consideration that local context is shaped and informed by external contexts (national, sub-regional, regional and global). It is argued that this orientation could ensure that university graduates receive relevant and quality education.

Introduction

Universities are expected to produce graduates who can lead efforts to address development goals on various professional fronts in the context of sustainable development (UNEP, 2006). University programmes should therefore be tailored towards producing graduates who are ready to cope with uncertainties and poorly defined situations, and who are able to construct new realities from existing contexts and experiences. A relevant and quality university programme is one that would enable university scholars to examine the economic, social, political and environmental contexts in which the programme operates to ensure that graduates are equipped to address real needs and that their research is relevant and useable (UNEP, 2006). As part of the collaborative effort to enhance relevant and quality environment and sustainability education in southern African universities, the University of Botswana conducted a small-scale research project to find out what stakeholder perspectives were on quality and relevance issues in relation to a proposal to introduce a Masters in Education (MEd) Degree in Environment and

Sustainability Education at the university. This effectively represents a consultative curriculum design process informing the proposed degree.

The research project was in line with the University of Botswana's goal to 'promote collaboration and partnership' (ORD, 2007:2). It was also in pursuance of the University of Botswana's research strategy objectives 'to stimulate high impact multidisciplinary research' (ORD, 2007:2). The research data were generated through a questionnaire and focus group interviews involving academics and environmental practitioners in Botswana and within the Southern African Development Community (SADC). It emerged that collaboration on research of this nature can be both enriching and challenging to those engaged.

Conceptualising the Research: Theoretical Perspectives

The terms 'relevant' and 'quality' in education can be perceived differently by different scholars and researchers. Different contexts and purposes of education, as understood by individuals or groups of people, seem to be the determining factor in how these terms should be given voice (Maila, 2005). Maila argues that quality in education should not only be seen as quantifiable set standards, but must also be noted as *capabilities* (after Sen, 1999); that is, being able to act/perform and add value to one's or one's community's quality of life.

The former South African Minister of Education, Kader Asmal, in 2004, delivering a keynote address at the 2002 World Summit on Sustainable Development in Johannesburg, pointed to the global challenges faced by humanity, and reiterated the need for a relevant and quality education for the 21st century. He proposed that there is an urgent need to thrust the discourse of education into a new paradigm, and that we needed to do this in a substantive engagement with the challenges, 'so that we can formulate concrete actions, commitments and partnerships' (Asmal, 2004: 9). Asmal seems to suggest that an education that is relevant and of quality should enable people to face global challenges head-on, and must be based on concrete action-taking strategies that are thrust forward by committed individuals and collective(s) in a supportive engagement. According to Le Grange (2005), the concrete actions and commitments should not only be grounded on narcissistic reflexivity (personal reflexivity), but also on reformist reflexivity (the collective as agents of change for the good of all). Such substantive educational actions call for praxeological change.

However, Ketlhoilwe (2007) cautions that varying degrees of structural factors may constrain or enable educators (educationists included) in operationalising the goal of their education praxis, and that these factors must either be eliminated or be mitigated to ensure the implementation of sustainable development. For example, Ketlhoilwe points out a number of such constraining educational factors, one of which is the complex terminology in the syllabi and textbooks (about Education for Sustainable Development). Asmal's point is similar to that made by Ketlhoilwe on the complexity of education for sustainable development language when he says, '… too often have our deliberations resulted in the addition of new terms to the existing lexicon of sustainable development. Constructing this new paradigm is not about coining new terms – seductive as they may be … it is about action' (Asmal, 2004: 9). We therefore

need to caution that quality education may be compromised by a number of contextual factors such as complexity of a particular field, as discussed above. While we are alert to this problem, it does not change our perspective that relevant and quality education ought to embrace a praxeological stance, and consider content-in-practice. Such a conception of quality education is deliberative in its knowledge construction approaches in order to produce knowledge that is context-based and inclusive of other ways of knowledge production besides those that currently dominate as 'scholastic reason' (Bourdieu, 1997) in universities. Environmental and sustainability education programmes at higher education institutions contribute to good quality teaching and learning (Bornman, 2004). In practice, quality education in the context of a higher education programme would be oriented towards enhancing transformative learning (UNEP, 2006; Wals & Corcoran, 2006).

Transformative learning aims at transforming society. It helps to bring about the fundamental changes demanded by the challenges of sustainability (Wals & Corcoran, 2006). Students would be 'more actively involved in the challenges in our time, and re-considering what we teach, and why we teach, what research we do, and why we do research is likely to introduce some new possibilities for adapting practice – and for innovation' (UNEP, 2006:26). Learning in the context of an environmental and sustainability university programme should aim at transforming society. Teachers would be expected to play the role of change agents (Wals & Jickling, 2002), while learners are actively involved in the learning processes. Transformative learning involves greater reconstruction of meaning, achievement of greater flexibility and less rigidity of thought and more emergence as a result of learning (Sterling, 2004). It requires pedagogy that enables and provokes students to move across levels of epistemic competence facilitated by the higher education curriculum. Inclusion of environment and sustainability topics and issues in higher education calls for a '… shift from transmissive methodology towards transformative methodology and a fundamental rethink of the academic mission of institutions' (Sterling, 2004:64). This argument proposes that higher education should become more participative and dynamic and embrace active learning processes based more on generating knowledge and meaning in context, and on real-world/situated problem solving than is currently the case (Sterling, 2004). Quality education in the context of environment and sustainability in a higher education programme requires re-orientation of the curriculum (both epistemology and pedagogy), as well as research innovations.

Curriculum re-orientation involves addressing *epistemological* challenges such as localising curricular to include local issues and concerns. This would involve a review of content and teaching and learning strategies to ensure that students are assisted to contribute to sustainability. A review of the content creates an opportunity to integrate social, economic and ecological issues. Local issues and concerns for sustainability may include culture, indigenous knowledge, gender, poverty, economic systems and sustainable communities – issues which have broader national, sub-regional and global contents as well as local contents, creating an interesting epistemological environment that embraces the local/global nexus. Such an approach to content would furthermore need to include a range of viewpoints to help students develop an awareness of the complexities of socio-ecological issues as well as their own view points to develop an understanding of a range of possibilities, embracing both complexity and reflexivity. Such a

content review would necessarily also include knowledge, skills, perspectives and values related to environment and sustainability, which are important to current and future societies (UNESCO, 2002), embracing both a values base for knowledge generation and an intergenerational scope for thinking about content. In addition, a re-orientation of the curriculum would take the key themes that underpin education for sustainable development into account. These include: overcoming poverty, gender equity, health promotion, rural transformation, human rights, intercultural understanding and peace, sustainable production and consumption, cultural diversity, and information and communication technologies (UNESCO, 2005). These have since increased to include some acute challenges that face us today, such as: human security, HIV/AIDS, governance, natural resources, climate change, sustainable urbanisation, disaster prevention and mitigation, corporate responsibility and accountability, and the creation of a more benign market economy (UNESCO, 2006). Reorientation of the curriculum in a southern African context would furthermore need to consider the holistic nature of education for sustainable development and encompass histories and principles of environmental education, the Millennium Development Goals and UNESCO's Education for All.

Scott and Gough (2004) argue that *pedagogically,* learning has to take place in a particular way, be learner-centred, draw together economic, environmental and social strands, and be applicable to a range of degrees of complexity. Quality education in the context of higher education will require pedagogies that consider the integrity of the ecological system, human health, learning and social skills, governance, justice, and positive values that contribute to and encapsulate sustainable society. Pedagogical discourse in the context of an environment and sustainability education programme would therefore revolve around promoting interdisciplinary learning, developing skills of analysis and problem solving, involving students in the learning process, and stimulating and facilitating understanding of action. It would also be based on changes in behaviour and attitudes (Scoullos & Malotidi, 2004). Scoullos and Malotidi (2004), however, neglect to focus on the changes required in structural conditions and enhanced forms of agency that allow for choice and deliberation. Such changes require critical, capability-centred and situated pedagogies (as discussed by Huckle & Sterling, 1996, Sen, 1999; Wals & Corcoran, 2006, amongst others). A combination of teaching and learning methods oriented towards agency, capabilities and social and structural changes are likely to achieve the learning objectives encompassed by education for sustainable development, as compared to a single strategy oriented towards sustaining the *status quo*. To strengthen and broaden teaching and learning approaches for relevant and quality education in the context of higher education programme on environment and sustainability education, epistemological and pedagogical discourses should be informed by research work.

UNESCO (2005) and Lotz-Sisitka *et al.* (2006) indicate that education for sustainable development in the United Nations Decade of Education for Sustainable Development (UNDESD) needs to be informed by research. Research could be participatory and action-based, emphasising systematic reflection by the researcher. This would include research into socio-economic and ecological problems in and within communities (Ketlhoilwe, 2008), or that which uncovers the educational processes and factors influencing the educational change process in response to environmental education and education for sustainable development

policy interventions and discourses (Ketlhoilwe, 2007). Such research may include '… the conceptual and practical links of environmental and sustainability education with other aspects of learning and with modes of development intervention (sectoral community mobilisation)' (UNESCO, 2004:29). UNEP (2006) advocates research that addresses the complex and dynamic interactions between nature and society. 'This requires building capacity in interdisciplinary and transdisciplinary research, understanding complex systems, dealing with irreducible uncertainty, and in the mobilisation and integration of diverse knowledge systems' (UNEP, 2006:54-55). Research in the context of environment and sustainability in higher education programmes needs to be re-oriented to be more reflexive (UNEP, 2006, Lotz-Sisitka *et al.*, 2006) and to draw perspectives from different disciplinary areas.

Besides these epistemological, pedagogical and research-based dynamics, enhancing university environment and sustainability education programmes involves a number of other structural and sociological aspects, such as improvement of teaching facilities, ICT infrastructure and pedagogical issues, networking, partnerships and collaboration through regional and international organisations. An understanding of these dynamics influenced our research design, process and data interpretation, as outlined below.

Research Aim, Objectives and Methodology

Research aims and objectives

The research aim was to investigate stakeholder perspectives on quality and relevance issues deemed essential to be taken into account when introducing an MEd degree in Environment and Sustainability Education. The research objectives were:

- To generate data for the introduction of a SADC responsive Environment and Sustainability Education MEd programme at the University of Botswana.
- To develop an understanding of what contributes to educational quality and relevance in an MEd Degree in Environment and Sustainability Education.

Qualitative research design and methodology

The research design adopted was qualitative and was influenced by the socially critical approach informing the design of a more responsive (relevance and quality) and collaborative curriculum, which takes account of stakeholder perspectives and socio-cultural and structural factors influencing education (Huckle & Sterling, 1996).

We initially intended to use a survey design for the study using questionnaires for key stakeholders, which, according to Awokeni (2004), should describe the population, design sample and process of choosing of respondents. We also planned to supplement the questionnaires with focus group interviews, which Isangedighi (2005) describes as being economical; they also allow inferences to populations that could be too expensive to study as a whole. Data collected for this study was therefore obtained through using questionnaire survey techniques and focus group interviews. The analysis was informed by a reflexive orientation as the researchers are practitioners offering environmental education programmes at the University of Botswana and are expected to be core lecturers in the planned Master of Education (Environment and

Sustainability Education) programme. Analysis also drew on insights gained from the theoretical perspectives outlined above.

Research respondents

The target population of the study was stakeholders in environment and sustainability education in Botswana and other SADC neighbouring countries. These included students, lecturers, environmental practitioners, education officers and officers from the mining industry.

The selection of all participants was purposive since they either received personally delivered questionnaires sent to them or were personally visited and invited for a focus group interview. The sample of the study was therefore made up of 50 respondents. Table 1 shows a breakdown of the respondents.

Table 1. Breakdown of original list of research participants

Institution	No. of Respondents	Research Technique	Comments
Education centres	14	Interviews and sent questionnaires	Those who did not return the completed questionnaire were contacted for follow-up interviews
Colleges of education	14	Interviews and sent questionnaires	Those who did not return the completed questionnaire were contacted for follow-up interviews
Primary schools	4	Interviews	Only interviews were conducted
Secondary schools	6	Interviews	Only interviews were conducted
Ministry of Education	2	Sent questionnaires	Questionnaires sent were returned in time
Parastatals, Department of Wildlife and National Parks (DWNP), Orapa Game Park	7	Sent questionnaires and interviews	A questionnaire and an interview were used
Universities	7	Sent questionnaires	All questionnaires sent were returned in time
NGOs	2	Sent questionnaires and interview	A questionnaire and an interview were used

Some methodological challenges

The challenges associated with using these research techniques are not uncommon. One of the challenges was the process of having to hand-deliver and electronically post the research questionnaire. As is often the case with questionnaire research, we had a low response from the selected respondents, and despite repeated follow-ups, we did not obtain an improvement in the rate of return. We then developed a research schedule to conduct the focus group interviews to

complement and extend the 25% of questionnaires that were returned. Due to time constraints we resorted to using the focus group discussion method as our primary research method, because it proved to be effective when it was initiated. This we attributed to respondents being more involved in the research process, since they were invited to participate in the research within a limited time on a person-to-person level instead of being sent the questionnaire to complete on there own.

The focus group discussions were however also challenging as some of the respondents were in distant places. Areas such as Maun, Kasane, Tsabong, Orapa and Gantsi are far (up to 1 000km) from our base in Gaborone. We therefore tended to rush in and rush out because of distance and time constraints. However, we managed to visit areas that we initially did not include in our travel schedule, such as Jwaneng and Orapa. These areas were visited to interview conservation and safety officers working at the diamond mines. We were also able to take advantage of environmental educators workshops that were organised in these mining areas to reach out to some respondents. The inclusion of these respondents in the study extended our sample to 56 people who contributed data to the study.

Findings of the Study

The results of the research investigation are reported according to epistemological, pedagogical and research challenges in the context of a relevant and quality environmental and sustainability education at a university level. These themes have been constructed from the main questions of the questionnaire items and responses, drawing from the theoretical orientation to the epistemological, pedagogical and research-based challenges in education for sustainable development described at the start of this paper.

Local value of the programme

The research data revealed that all respondents agreed that it was important for the University of Botswana to start an MEd programme specialising in environment and sustainability education. Reasons advanced for starting such a postgraduate programme were varied but complementary. They include both epistemological and pedagogical concerns, contextual issues and advantages, and lack of appropriate skills (in the nation) that the respondents thought the introduction of the programme would address. One respondent commented that 'environmental education informs the nation about environmental issues and problems that exist around them. It is expensive to study a postgradue programme outside the country. To have it locally will cut the costs'.

The respondents commented that the introduction of an MEd programme in environment and sustainability education would open learning opportunities for educators and those in the non-formal sector to pursue environmental and sustainability education. They revealed that the programme would support the University of Botswana's initiatives to become a centre of excellence in Africa and beyond. Some respondents claimed that instead of local people leaving to study outside the country, they would be provided with the opportunity to study locally. This would ensure that the students receive relevant education and would reduce costs

of sending people outside the country to pursue postgraduate degrees. They claimed that by initiating the postgraduate programme in environment and sustainability education the University of Botswana would be conforming to an international standard of education in which environmental and sustainability education is seen as integral to all forms of learning. One respondent observed: 'Environmental and sustainability education informs the students about environmental issues and problems that exist around them and beyond. It is about sustaining resources for current and future generations.'

Epistemological issues

With regards to epistemological concerns, about 35 respondents said an advanced (postgraduate) programme should provide students with in-depth knowledge on environmental education, which would avoid the problem of shallow understanding. In support of this observation, one of them said the programme would 'equip students with detailed knowledge and skills to effectively teach and facilitate learning on environmental education and sustainability'. Another respondent commented that,

> *… for the University of Botswana to become a hub of education for excellence it needs to conform to the international standards of education in which education for sustainable development should be part of its agenda. The fact that Botswana is the second driest country [after] Namibia south of the Sahara Desert, means that it needs to acquaint itself with issues like climate change that are facing the region and the country at large at post graduate level. Therefore, the University of Botswana needs to educate the community on issues that have become part of life (drought, poverty, etc.) currently in the region.*

Of the 51 respondents, 45 of them said that a postgraduate progrmme would enhance quality and relevant education to the present needs of Batswana and other nations beyond its borders. One of the respondents said that:

> *… environmental education can contribute significantly to a deepening understanding and enriching of learning processes because of its contextual nature. It does focus on relevance in local contexts, but also supports students to explore relevance at national and global levels.*

Another respondent said:

> *Environmental education is a field of study which has no boundaries and has relevance to every living [organism] on earth and I feel that knowledge, attitudes and skills sharing will be more coordinated and useful if nations are taken on the same wave length.*

However, one of the respondents warned that:

> *… the programme should not copy. What we take from others must be contextual. Environmental issues are focus issues of the world arena.*

This caution seems to suggest that we need to contextualise actions in the environment in relation to their global context. The following comment made by one of the respondents seems to capture the different observations made by other respondents to this theme:

> *It is frequently stated that UB is not addressing the problem of educating and training people for real and present needs in various fields in Botswana; however, I've yet to see this to be identified as a present need … Some day some will realise that this type of education is needed here as well as in neighbouring countries and indeed beyond them. At present should someone desire to get an MEd in this field they have to go abroad to do it.*

The respondents also provided insight into themes that ought to be considered in the MEd in Environment and Sustainability Education. Respondents were asked to choose from three alternatives to indicate what they thought ought to be the main focus of the programme from an epistemological point of view. The choices were: (A) sound knowledge of national and global trends and agreements, (B) national and global sustainability and environmental issues, and (C) national and global imperatives regarding developments. In selecting from these options, 35 respondents chose A and B, 10 chose A and C, and 5 chose B and C. Respondents seemed to think that both national and international trends, agreements, protocols and development aspects related to environment and sustainability were critical for inclusion in the MEd programme in Environment and Sustainability Education at the University of Botswana. One respondent argued that to enhance quality and relevance in the context of a university programme, it should be noted that environment and sustainability issues are transboundary. They affect people beyond and across boundaries. Therefore, a postgraduate university programme should address the present needs of Batswana and other nations beyond its borders, and beyond traditional boundaries (including knowledge, time-space and material boundaries).

Pedagogical issues

There were limited responses generated from the respondents regarding appropriate pedagogies for environmental and sustainability education in the context of a relevant and quality university programme. However, some respondents claim that teachers are not effective in their teaching of environmental education, and the programme would therefore need to pay attention to ways of equipping such teachers with relevant and quality methodology knowledge and skills that would make them effective in their teaching and learning work. Most respondents emphasised that for the programme to be relevant and be of quality in education, it should have a qualitative approach to life for people to interact better with the environment – implying a *situated learning pedagogy* for the programme. They did, however, think that it would depend on teaching and learning philosophy of the university and what a university programme would offer in terms of general knowledge generation, skills, research and its outlook in terms of depth and analysis of issues. They also said that it should not be boxed within the local context in isolation. This implied that situated learning should not be the only pedagogical strategy, and that it should be complemented by other strategies for learning, which could broaden knowledge beyond the local (for example, through research or use of information communication technologies). As

one respondent stated, '… it is therefore envisaged that a postgraduate university programme would enhance and shape environmental and sustainability education processes'. This comment indicated an expectation of pedagogical innovation which could contribute to the field of environmental and sustainability education. The respondents observed that a university programme needed to be research-oriented to enable students to interact with complex situations in the context of relevance and quality in environment and sustainability education, thus proposing a research-based learning approach for the curriculum.

Research issues

Since respondents raised a number of issues which could be researched in environment and sustainability education with the goal of enhancing quality and relevant education (i.e. through the research-based learning pedagogical approach mentioned above), these are categorised into epistemological, pedagogical concerns, and contextual issues. This range of research aspects points to a curriculum that is oriented towards knowledge-building, methodological enhancement and situated learning.

Epistemological concerns raised by 40 of the respondents focused on lack of knowledge in issues such as water and air pollution, waste management and disposal (especially clinical waste disposal), the nexus between environment and development, policy formulation and implementation on the quality of environment, global warming, imbalances in trade – the North-South divide, HIV/AIDS, and the environment. Some of the respondents also mentioned socio-economic, political and ecological demands, cultural diversity, economic empowerment, food security issues, poverty, conflicts and local knowledge.

About 20 respondents raised pedagogical issues relating to education in environment and sustainability. The issues raised related to how we learn in environment and sustainability education, how best the nation could be educated in environment and sustainability and how globalisation and environment could be explored through SADC's Regional Environmental Education Programme and the UNDESD.

Respondents also indicated that the programme could explore a range of contextual issues such as the peace parks conservation programme, trans-frontier conservation areas (TFCAs), trans-boundary natural resources management (TBNRM), environmental impact assessment (EIAs) as a tool to ensure sustainable development, health problems and their dimensional causes and solutions, human rights and justice issues and sustainable use of natural resources. One respondent suggested that the students in the MEd programme should be involved in a situation and needs analysis to assist them in prioritising contextually relevant themes and issues for classroom discourse and research.

Besides these, other pertinent environmental and sustainability education research-based topics suggested by the respondents included environmental trends, genetically modified food, industry and environment, curriculum development, gender issues, knowledge and knowledge generation, ethics and environment, research, technology and environmental sustainability, civic education, and population explosion. The research revealed that a more responsive and transformative programme would even include current socio-economic issues such as recurring electricity cuts in some countries in southern Africa. Such a programme would

sensitise students to the importance of understanding and addressing environmental problems such as poverty.

As indicated by this wide and varied list, these issues and concerns provide rich choice for academic engagement with students and the community, reflecting relevance and the quality of a university MEd programme. It also reflects a need for course developers to cluster and organise a range of issues into a coherent framework for students so as to avoid epistemological confusion.

Sharing research information and outcomes

Respondents also had suggestions on how the knowledge to be generated through the research-based learning processes in the MEd Degree in Environment and Sustainability Education could be shared more widely for the benefit of the educational and other communities in Botswana. They proposed that information generated through the university research programme could be shared generally through seminars, journal publications or as book chapters. This research explored ways of sharing the findings to establish or strengthen relevance and quality of the University of Botswana research programme. The research revealed that findings could be shared through newspaper articles and feedback sessions with participants (respondents). However, the following ways of disseminating information were also mentioned by the respondents: public lectures and presentations, websites, papers at conferences, publishing findings internally and externally, depositing research reports in the library, and being present at National Teachers' Education and Training conferences and other education forums. This multi-pronged and diverse strategy for sharing knowledge emerging out of the programme would contribute to the relevance and the quality of the programme, since it would invite feedback and knowledge exchange.

Discussion of Results

Notwithstanding the fact that the mini research only focused on a small sample, the ensuing thematic discussion of the results shows that the research generated sufficient reasons to understand issues of relevant and quality education in the context of the proposed MEd Degree in Environmental and Sustainability at the University of Botswana.

Although respondents agreed that it was necessary to start a MEd programme specialising in environmental education emphasising sustainability education, their justification for this varied from contextual, epistemological, pedagogical reasons, to lack of appropriate skills in addressing environment and sustainability matters. Some of the contextual reasons advanced by the respondents were that the envisaged environmental and sustainability education progamme would enhance and complement the current University of Botswana's MEd programme, and would help develop individuals to be environmentally conscious and to be good caretakers of the environment. This related to understandings of the university's role in society, in which the university is seen to have a social obligation to provide advanced learning opportunities in environmental and sustainability education (see UNEP, 2006) in response to the myriad of issues and themes identified by the research respondents. This reflected a belief that the state of the

environment nationally (in Botswana) and worldwide was sufficient justification for the need to provide the intended programme. The findings further reflected an expectation of education – that it should be viewed as a vehicle for social transformation. UNEP (2006) explains that environmental education has long been viewed as having a role to play in social transformations. Environmental education and education for sustainable development, in particular, envisions a world where everyone has the opportunity to benefit from quality education and learn values, behaviours and lifestyles required for a sustainable future (UNESCO, 2005).

The findings also suggest that relevant and quality environmental and sustainability education can contribute significantly to a deepening understanding and enriching of learning processes because of its contextual nature. A caveat to this, was, however, that for such education to be relevant and of quality, it should also support students to look at relevance at national and global levels. This is because environmental education is about real-life issues and experiences. Environmental issues and problems do not recognise national, regional or even international boundaries and they have both local and global dimensions (UNEP, 2006).

Epistemological challenges

The epistemological (knowledge) and skills issues were perceived by respondents as key to the programme envisaged. They thought that the programme would not only provide opportunities to advance environmental and sustainability education, but that it would provide for in-depth knowledge of these fields of knowledge, and that through this it would equip students with detailed knowledge and skills to effectively participate in transforming society for a sustainable future. The courses offered at undergraduate level only provide basic skills and knowledge on environmental education. More complex and diverse knowledge is needed at a postgraduate level. The means of achieving this was through a researched-based learning process involving research that could identify gaps in existing environmental and sustainability education and provide students and scholars with opportunities to further the boundaries of knowledge in environmental and sustainability education. As argued by UNEP (2006), Wals and Corcoran (2006) and others, university programmes ought to develop human resources capable of integrating social and economic equity, environment and development issues in creating new, transformed societal contexts. Such programmes should also promote the development of lifelong learning skills based on problem- and project-oriented approaches, which UNEP (2006) and Wals and Corcoran (2006) see as processes of transformative learning. Issues such as gender equity within the areas in which the university operates should be examined to ensure relevance and quality of the programme; as argued by UNESCO (2005), who proposes the integration of gender issues into the education for sustainable development agenda. Taking gender issues seriously in a curriculum context also requires a broadening of epistemologies, as argued by feminist and other researchers (UNEP, 2006).

The findings reveal that an MEd in Environmental and Sustainability Education at the University of Botswana should be informed by national and international environmental issues. That is, the programme should cover national and international epistemological and be pedagogical thinking in the environmental education field, as well as emerging issues, challenges, development and problems on environmental and sustainability education. This

creates an open framework for epistemology in the programme, since such relations are ever-changing and emergent, currently within a globalisation-driven neo-liberal model of development which is subject to change, as outlined by the sustainable development agenda. There is need to include national and global environmental agreements in the programme because issues and problems affect the entire world. There is therefore a need for Botswana to collaborate with other countries (regionally and internationally) to be environmentally sensitive. Botswana belongs to the global community. There is no way we can work or do things that affect others without consequences. Issues that affect the environment are global, but they have particular localised effects; as in the case of the projected impacts on Botswana as a result of climate change, since it is an already dry country with scarcity of water resources. It is therefore critical that MEd students undertaking the Environment and Sustainability Education degree have an in-depth knowledge of environmental issues and problems, and that they understand these issues within a local/global, open-ended and transdisciplinary, transboundary epistemological framework. The findings confirm some of the recommendation themes that the programme could include that underpin education for sustainable development, such as power relations, gender equity, health risks and vulnerability, cultural diversity, climate change and information technology, as outlined by UNESCO (2005) and UNEP (2006). The research has revealed that students enrolled in the programme should be open to learning from the global community to contextualise their learning and actions, and to inform their practices and programmes. This counts for course developers too. The challenge is to effectively integrate local issues in environment and sustainability education higher education programmes within a global, open-ended, transboundaried framework. This requires consideration of knowledge, skills, perspectives and values related to sustainability (UNESCO, 2002).

Pedagogical challenges

Pedagogically, the findings suggest that a relevant and quality programme would advance education policy dictates regarding the infusion of environmental and sustainability issues in teaching and learning (i.e. integrated approaches). Research, of which this paper is a product, has revealed that environmental and sustainability education is a must today because the entire future of this world rests upon it. A postgraduate university programme would provide students with opportunities to carry out projects that are relevant and contextually focused, promoting situated learning. Sterling (2004) argues for a shift from transmissive to transformative pedagogy. This notion has been confirmed by some of the research respondents, as outlined in the discussion on pedagogy above. It is observed that transformative pedagogical discourse would enhance a more participative, dynamic and active learning methodology. This is related to Huckle and Sterling's (1996) argument that education must be transformative for it to be transforming. Other pedagogical approaches could be problem-oriented teaching and learning as well as research-based learning involving investigation of environmental issues and concerns and educational aspects and problems, as indicated in the findings reported above. As mentioned in the theoretical perspectives section of this paper, Scott and Gough, (2004) support a learner-centred pedagogy drawing together economic, environmental and social strands applicable to a range of degrees of complexity. The findings of this research indicate that respondents

support a similar pedagogical orientation, as shown by the range of issues they identified as focus for a research-based learning pedagogical orientation. As Scoullous and Malotidi (2004) argue, this will be pedagogical approaches that promote interdisciplinary learning. UNESCO (2004) and UNEP (2006) argue that through interdisciplinary and multi-disciplinary approaches a university programme is likely to provide an understanding of complex systems and uncertainties (UNEP, 2006; UNECSO, 2004), thus providing an appropriate pedagogical orientation for the open-ended and uncertain nature of the different issues identified by the respondents that need incorporation into the MEd programme.

Research challenges

The research findings indicate that relevance and quality in education could be enhanced through the research agenda of a university programme, and through a research-based learning approach to the curriculum. This research has revealed that research projects focusing on educational issues oriented to the resolution of socio-ecological issues and concerns such as water and air pollution, waste management and disposal, global warming (and climate change), the impact of the North–South divide on environment, HIV/AIDS, and the environment could also contribute to relevance and quality in education. As noted above, the respondents raised a number of other issues that could form a rich fabric for a research-based learning curriculum in the MEd programme. The range of issues identified by the respondents for the research-based learning curriculum are similar to those recommended by UNESCO (2005) and UNESCO (2006), but UNESCO does not provide a coherent organising framework for presenting the links between these issues. Epistemological issues such as using research knowledge and information to inform transformative practice and change could also contribute to quality education. This would include exploring contextual concerns such as socio-ecological issues in relation to broader questions of structure and agency (as indicated by the social-critical education orientations mentioned above [e.g. Fien, 1999] or agency and capabilities [e.g. Sen 1999]). By developing these wider conceptual frameworks for researching contextual socio-ecological issues, the research agenda would also explore pedagogical issues in both formal and informal education to enhance relevance and quality in MEd programme in ways that are transformative, as proposed by Sterling (2004), UNEP (2006) and Wals and Corcoran (2006).

A balanced programme with coursework or research on both environment and education content is essential for quality education in the context of environment and sustainability education MEd programme. Issues and themes relating to environmental content could be linked to sustainability concerns and merged into educational discourses and research-based learning processes. As argued above, such themes and issues explored should contribute to social transformation in the context of sustainable development, and will also include explorations of transformative research methodologies in the critical tradition (e.g. Ketlhoilwe, 2007; Lupele, 2007) that can underpin the research-based learning and pedagogical and epistemologically transformative curriculum proposed by the respondents in this study. Perhaps this will also help students in the MEd programme to avoid some of the problems associated with questionnaire-based research that we experienced at the start of this study.

Conclusion

In conclusion, the mini research study revealed that there is a need to introduce an MEd Degree programme in Environmental and Sustainability Education at postgraduate level at the University of Botswana. The respondents indicated that teaching and learning processes on this programme should be oriented towards transformative, reflexive and independent learning through the use of a research-based learning approach to enhance relevance and quality in university education. The programme should promote reflexive and transformative education processes facilitated by self-reflective curriculum designers and lecturers who are prepared to take account of stakeholder views and interests in the curriculum design. As indicated by the respondents in this study, a university programme aimed at promoting social transformation should not only be interdisciplinary, but should also empower students to deal with complex situations and uncertainties within an open-ended epistemological framework that takes the local/global/transboundary knowledge context into account. A relevant and quality environment and sustainability education university programme should promote learner-centred, transformative pedagogies that are both situated so that they empower students to link socio-ecological issues and development in local context, and exploratory to consider these issues more widely within a futures and intergenerational framework. Such a degree programme should graduate people who are not only able to deal with uncertainties, but who are also able to, within local and global context, accommodate different perspectives. The research-based learning curriculum should enable the students not only to use information technology in the generation and acquisition of knowledge, but also to use different media to disseminate research outcomes, and methodologies that are transformative in their nature and intent (e.g. critical methodologies). For the university to achieve a high level of academic excellence and greater impact on the national economy and society's well-being and to optimise its benefits for the community, its research programme should be responsive in such a way that it promotes regional and international collaboration on environmental and sustainability issues to promote relevant and quality education.

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Sustainability Assessment Using a Unit-based Sustainability Assessment Tool: The case of three teaching departments at Rhodes University, South Africa[1]

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Abstract

A sustainability assessment study was performed with three teaching departments at Rhodes University – Ichthyology and Fisheries Science, Anthropology, and Accounting. The assessment used a Unit-based Sustainability Assessment Tool (USAT) and was guided by systems thinking and the ontological framework provided by critical realism. Results of the study showed that the Department of Ichthyology and Fisheries Science had a higher integration of sustainability issues in its activities than the other departments sampled, with Accounting having the lowest integration. Interviews conducted with departmental heads and content analyses of documents revealed differences in sustainability issues addressed and in approaches used in tackling them among these departments. The study is intended to inform the Mainstreaming of Environment and Sustainability in African (MESA) Universities Partnership, which promotes mainstreaming environment and sustainability in universities during the United Nations Decade of Education for Sustainable Development. The study does not provide answers to mainstreaming activities, but opens up space to debate and deliberate how to deal with the mainstreaming of sustainability in universities. It identified some of the challenges to be addressed in university-wide mainstreaming work, and affirmed the need for systems thinking in bringing about change at institutional level to extend changes taking place in individual teaching contexts.

Introduction

The concept of sustainable development emerged in the early 1980s due to a realisation of the need to balance economic growth and social progress with environmental concerns (Banerjee, 2003). It became prominent in the late 1980s through the work of the 1987 Bruntland Commission, which led to the defining of sustainable development by the World Commission on Environment and Development (WCED) (1987:43) as 'development that meets the needs of the present without compromising future generations to meet their own needs'. The WCED (1987) explained that sustainable development requires balancing economic growth with environmental protection and social well-being without stopping development altogether. The concept has, however, been subject to varied interpretations, hence the controversy regarding its meaning and what it entails (Banerjee, 2003; Pittel, 2002; Jickling 2005; Haque, 2000). Economists, for example, emphasise protection of environment to sustain economic development, while environmentalists stress non-depletion of resources (Carter, 2001).

The theory of resilience is increasingly being used in sustainable development discourse. Holling (1973:14) defines resilience as 'a measure of the persistence of systems and of their ability to absorb change and disturbance and still maintain the same relationships between populations or state variables'. The more resilient a system, the larger the disturbance it can absorb without shifting into an alternate regime. Without resilience, ecosystems become vulnerable to disturbances that could previously be absorbed (Walker *et al*., 2006). Folke *et al*. (2002) maintain that the goal of sustainable development is to create and sustain prosperous social, economic and ecological systems. These systems are, however, inextricably linked as humanity depends on ecosystems services for its wealth and security. People rely on ecosystems for services like clean water and air, food production, fuel, and so forth. At the same time, humans can positively or negatively transform ecosystems into more or less desirable conditions respectively. Destruction of ecosystems by humanity can have serious implications on human livelihoods. Human and ecological systems are therefore dynamic, interacting and interdependent (Folke *et al*., 2002). Resilience provides an important concept in appreciating and dealing with such complex relationships so as to promote sustainability of the systems. They introduce the concept of diversity as being valuable in complex adaptive systems and in resilience building (Folke, 2006), a concept which has some relevance when considering the diverse responses of university departments to sustainable development, as indicated in the analysis below.

Universities, through their mission of teaching, research and community service, serve as centres for the creation, transmission, critique and dissemination of knowledge (Tünnermann Bernheim & de Souza Chaui, 2003). They play a special role in seeking solutions to societal problems and should be concerned not only with economic growth, but other social, cultural, and political issues as well (Badat, 2007). Among the major challenges of society today, in which universities are expected to play a key role, is sustainable development.

The centrality of the role of education in sustainable development was emphasised at the Rio Conference in 1992 through chapter 36 of Agenda 21 (Ogbuigwe, 2006). In 2002 at the World Summit on Sustainable Development, education for sustainable development (ESD) was identified as a critical intervention area for furthering the goals of sustainable development at a global level. The United Nations General Assembly then declared the United Nations Decade of Education for Sustainable Development (UNDESD) (2005-2014) following the recommendation of the World Summit on Sustainable Development Plan of Implementation (Ogbuigwe, 2006) and universities, among other higher education institutions, were challenged to play a role through their functions and operations. Universities are encouraged to utilise their core functions of teaching, research and community engagement to address sustainability issues in the contexts in which they operate (UNEP, 2006). In the ongoing process, they should inform and educate not only students, but also their employees and societies about sustainable development and the consequences of environmental degradation (Delakowitz & Hoffman, 2000).

While much faith has been placed in universities, they also face the problem of poor understanding of the concept of sustainable development (Katikiti, 2000). There are misconceptions of what the process of sustainable development entails and what sustainability represents to these institutions (Leal Filho, 2000). Carrying out sustainability assessments, especially at departmental level, is therefore important as it helps to establish how various

disciplines are conceptualising the contested and controversial concept of sustainable development, and also helps to establish the current status of sustainability work in progress.

This study is part of an ongoing project which is investigating a systems approach to mainstreaming sustainability issues into African universities. The broader project will develop a sustainability picture of Rhodes University from assessing various sections of the university, including teaching departments, operations and management, and student involvement. The study is situated in the Mainsteaming of Environment and Sustainability in Africa (MESA) Universities Partnership, and has been led by the United Nations Environment Programme and key partners such as the African Association of Universities, UNESCO and others since 2004 with the objective of enhancing the quality and relevance of university education through implementation of environmental education and sustainability across university operations and functions (Ogbuigwe, 2007; UNEP, 2008). The MESA partnership programme is scheduled according to three phases which run for the duration of the UNDESD. The first phase (2004-2007), in which the objective was to establish and pilot the MESA Universities Partnership in 15% of universities, was successfully completed and participating universities have started mainstreaming environment and sustainability issues into their activities (UNEP, 2008).

The first phase of the MESA initiative was, however, heavily dependant on initiatives of individual MESA participants; thus among the key lessons learnt is the fact that there is need for a systems approach to expand and strengthen these initial efforts so as to bring about change at institutional level (UNEP, 2008). The second phase of the MESA Universities Partnership is aimed at consolidating and strengthening the partnership project activities in 30% of African Universities (UNEP, 2008). This ongoing study is oriented towards informing the second phase of the MESA Universities Partnership through supporting the establishment of tools for enabling a systems approach to sustainability in universities.

The study draws on critical realism (Bhaskar, 1978) as an underlying philosophy. One of the propositions put forward by critical realism is the belief that things do not happen by chance, but there are causal mechanisms that generate them. These mechanisms may exist unexercised, meaning recognition by critical realism that what has happened does not exhaust what could happen (Sayer, 2000). Critical realism proposes ontological distinction of reality into levels resulting in a stratified ontology; that is, the real level of objects, their structures and powers, the actual level of flows or consequences of events, and the empirical level of observed events (Benton & Craib, 2001). Critical realism also argues that the world is characterised by emergence; situations where the conjunction of two or more features give rise to new phenomena (Sayer, 2000). Stratified ontology is being used in the ongoing project to probe the causal factors influencing sustainability at Rhodes University, with the empirical and the actual levels forming the focus of the sustainability assessment while the real level will assist in probing mechanisms that can be activated to improve integration of sustainability issues (see also Lupele, 2008).

Systems thinking developed in response to the problem of science in dealing with complexity and is employed in the study as an epistomology. Classical natural science was said to be reductionist in the sense that it simplified reality by isolating components from a complex and messy world before analysing them piecemeal and derived properties of the whole directly from those of parts, thus leaving out emergent properties which result from the joining and

integration of the web of relationships between the parts (Banathy, 1997; Bertalanffy, 1968). The fundamental concept in systems thinking is therefore holism or organicism and this originated from early systems thinking which were meant to develop a consistent holistic approach of understanding complexities beyond the capability of a single discipline (Checkland, 1999). More recently, complex adaptive systems theory is also emphasising a new set of concepts, which include reflexivity, diversity and interactions, cross-scale dynamics, surprise and uncertainty (Folke, 2006). Such systems thinking considers 'structures and processes in a dynamic fashion' (Folke, 2006:259). Education systems like universities were classified as human activity systems, designed for a specific goal or purpose (Banathy, 1997). Systems thinking influenced the development and use of the Unit-based Sustainability Assessment Tool (USAT) (Togo & Lotz-Sisitka, 2008), which allows the construction of a 'whole' picture of sustainability at the university from sectoral and departmental assessments. It is also being employed to facilitate identification of major issues to be addressed at Rhodes University at the level of cross-faculty and cross-scale dynamics, so that mainstreaming of sustainability issues can be a university-wide initiative, located within a wider environment in which the university is located and interacts with. The study relies on the methodological process of abstraction to isolate individual objects of focus (which include processes of change and emergence) from complex and messy open social systems, so as to study them as individual components before building the whole picture again (Sayer, 1984).

Research Design

As part of the ongoing study, the USAT (Togo & Lotz-Sisitka, 2008) was developed based on a disciplinary framework where assessment would be possible at the level of individual departments or units. This unit-based framework was intended to cater for the multidisciplinary, multi-institutional and multi-process nature of sustainable development issues where initiatives, approaches or the dimensions addressed could possibly differ in various disciplines, departments, units and/or facets of university life (e.g. student activities or estates management). The alternative would have been to begin with a wide-scale assessment of the whole university, where detail specific to disciplines and units of activity might have been lost. This methodology has potential to provide for both – detail specific to disciplines and units of activity, *and* a wide-scale assessment at university level.

For this paper, the USAT was used to rate sustainability performance in the Department of Ichthyology and Fisheries Sciences, the Anthropology Department and the Accounting Department, in terms of integration of sustainability issues in their teaching, research and community engagement. The tool is divided into three parts intended for assessing sustainability in particular sections of the university's activities. Part A focuses on teaching, research and community service, Part B on operations and management, and Part C on students' involvement. Only Part A was used for the purpose of this study. It is composed of 20 indicators clustered into five groups, namely curriculum, teaching approach, research and service, examination, and staff expertise and willingness to participate (Table 1). The indicators were coded for easier graphical representation.

Table 1. USAT Part A scoring sheet outlining indicator clusters and codes

Code	Indicator	Score					
		x Don't know	0 None	1 A little	2 Adequate	3 Substantial	4 A great deal
Curriculum							
C1	The extent to which the department offer courses that engage sustainability concerns						
C2	The level of integration of sustainability topics in courses referred to above						
C3	The degree to which local sustainability issues and challenges form part of the department's teaching programme						
C4	The degree to which global sustainability issues and challenges form part of the department's teaching programme						
C5	The extent to which the department enrol students in courses that engage sustainability concerns						
Teaching approach: The extent to which the teaching approach contributes to development of the following characteristics among students:							
T6	The capacity to make informed decisions						
T 7	Critical thinking skills						
T 8	A sense of responsibility						
T 9	Respect for the opinions of others						
T 10	Integrated problem solving skills						
Research/service and scholarship activities							
R11	The extent to which the department (staff and students) is involved in research/service and scholarship in the area of sustainability						
R12	The degree to which global sustainability issues and challenges form part of the department's research and service						
R13	The degree to which local sustainability issues and challenges form part of the department's research and service						
R14	The extent to which your department is collaborating with other institutions and stakeholders in pursuit of solutions to sustainability problems						

Code	Indicator	Score					
		x Don't know	0 None	1 A little	2 Adequate	3 Substantial	4 A great deal
Curriculum							
R15	The extent to which aspects of sustainable development are used in selection/execution of research/service						
Examination of sustainability topics							
E16	The extent to which sustainability aspects are examined during course						
E17	The extent to which sustainability aspects are considered in evaluating projects/traineeships						
Staff expertise and willingness to participate							
S18	The level of expertise of staff members in the area of sustainability						
S19	The extent to which staff members are willing to carry out research and service activities on sustainability aspects/topics						
S20	The extent to which staff members are willing to teach sustainability topics						

Table 2. Assessment criteria

Rate	Meaning	Interpretation
X	Don't know	No information concerning the practice
0	None	There is total lack of evidence on the indicator
1	A little	Evidence shows poor performance
2	Adequate	Evidence shows regular performance
3	Substantial	Evidence shows good performance
4	A great deal	Excellent performance

The heads of the three departments were responsible for rating departmental performance basing on evidence demonstrating the presence of the identified indicators. The assessment criteria used was characterised by ordered response levels ranging from 0 to 4 while X was a response category where the head of the department lacked information regarding the practice (Table 2). Rating was done on the USAT scoring sheet outlining the indicators (Table 1).

The departmental sustainability assessments were accompanied by interviews and content analyses of documents. Only heads of the three departments were included in the study as they were well placed to give an overview of their departmental activities. An interview guide was used in data gathering. Content analyses of documents helped to clarify the nature of sustainability issues addressed by these departments, and provided a valuable triangulation mechanism to verify and extend the interview and USAT questionnaire data, enabling a more comprehensive picture of sustainability activities in each department to emerge. Analysed documents were as follows:

Department of Ichthyology and Fisheries Sciences

- Britz, P. & Davies, M. (2007). Review of the Department of Ichthyology and Fisheries experimental fish farm, unpublished, Rhodes University, Grahamstown.
- Ichthyology 201 handout, 2007.
- Ichthyology 301 handout, 2007.
- Ichthyology honours handout, 2007.
- Ichthyology 201 theory examination paper, 2007.
- Ichthyology 301 theory examination paper, 2007.
- Ichthyology honours theory examination paper, 2007.

Anthropology Department

- Owen, J. (n.d.). Research in anthropology. Retrieved from: http://campus.ru.ac.za/index.php?action=category&category=1016 on 27 February 2007.
- Environmental Anthropology course guide, 2007.
- Anthropology of Tourism course guide, 2007.
- People and Parks course guide, 2007.
- Environmental Anthropology examination paper, 2007.
- Anthropology of Tourism examination paper, 2007.
- People and Parks examination paper, 2007.

Accounting Department

- Rhodes University (2007). Calendar 2007. Rhodes University, Grahamstown.

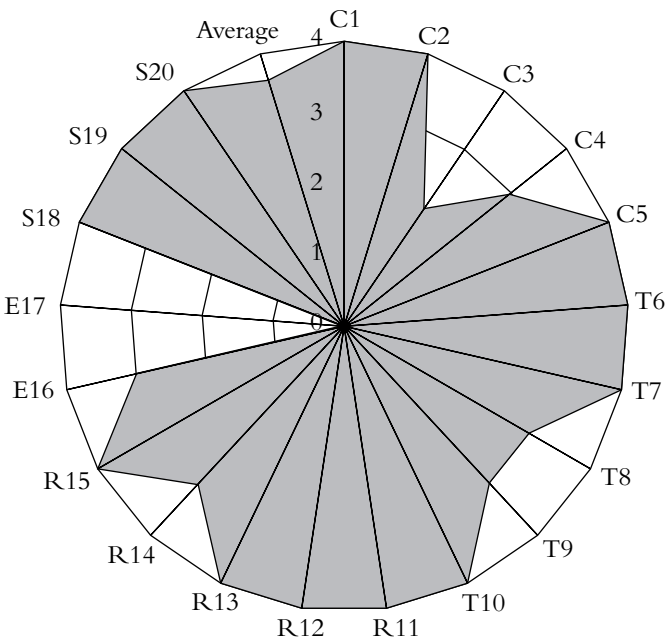
Results

The sustainability assessment revealed variations in the extent of integration of sustainability issues among the three departments examined. The Department of Ichthyology and Fisheries Science had the highest level of integration of sustainability (based on the USAT indicators) with a total score of 69 out of a possible 80 (86.3%). It was followed by the Anthropology Department with a total score of 49 (61.3%), while the Accounting Department had the smallest score of 23 (28.8%). There were differences in sustainable development issues addressed and the approaches used to deal with such issues. The teaching approach cluster scored highest in all three departments with the majority of indicators rating 3–4.

The Department of Ichthyology and Fisheries Science

Figure 1 is a graphical presentation of the results of the sustainability assessment in the Department of Ichthyology and Fisheries Science. Most of the indicators had high scores, showing high integration of sustainability issues across its activities. E17 was rated N/A (not applicable) as the activity represented by the indicator (evaluating projects/traineeships) was not part of the department's operations. According to the assessment criteria, this automatically translates to zero as it shows lack of evidence on the indicator (Figure 1). All the other indicators scored 3 to 4 – except C3, which scored 2. The average score for the department was 3.6.

Figure 1. Sustainability performance of the Department of Ichthyology and Fisheries Science



Content analyses of documents showed that the department is oriented towards sustainability issues. Its vision and mission statement reads:

> To be a leading African academic institution supporting the sustainable utilisation and study of fish through the teaching and training of students, research and appropriate service provision. (Britz & Davies, 2007:3)

The department teaches fundamental knowledge about fish and the environment, for example anatomy, evolution, ecology and genetics. Besides that, it is involved in teaching about ecosystems, conservation, ichthyology, fisheries and resources management and aquaculture (Ichthyology 201, 301 and honours handouts). According to the interview, this 'helps society understand our environment which obviously contributes to sustainable management' (Participant 3, pers. comm., January 2008). The sustainability aspects that are taught during the course of

the programme are also examined. In 2007, for example, questions were on fish form and behaviour, fish environments, conservation, factors affecting fish populations and management of fish, design and management of aquatic ecosystems, and development of aquaculture as a food production industry (Ichthyology 201, 301 and honours 2007 examination papers).

The department is involved in projects more directed at managing the environment sustainably as well as applied work, such as devising management plans for aquatic systems. This includes a biological as well as an economic and a social dimension (Ichthyology 201, 301 and honours 2007 examination papers). Students undertake multidisciplinary or transdisciplinary projects with a developmental angle where they address biological and socio-economic issues. However, though they contextualise social and economic aspects, the department has a biological focus in its approach.

> *We do, broadly speaking, teach students about environmental management but with a focus on biology, but we do contextualise the relevant social and economic aspects.* (Participant 3, pers. comm., January 2008)

In the community the department looks at livelihood opportunities, such as the utilisation of dams for fishing by Eastern Cape rural communities. It is working with provincial departments of agriculture to promote aquaculture (fish farming) in all the provinces and sustainable management of aquatic ecosystems. It reaches as far as the Southern African Development Community region (14 southern African countries) in development projects based on aquatic resource utilisation (Participant 3, pers. comm., January 2008).

These undertakings are complemented by the availability of staff members who are skilled in the sustainability area and who are also willing to teach and do research on sustainable development issues. High scores in the teaching approach cluster suggest that the department is promoting the development of skills necessary for a sustainable society.

The Anthropology Department

In the Anthropology Department most indicators rated between 2 and 3. The teaching approach cluster of indicators scored between 3 and 4. Only the examination and research clusters had some indicators scoring below 2 (Figure 2). The department's average score was 2.5.

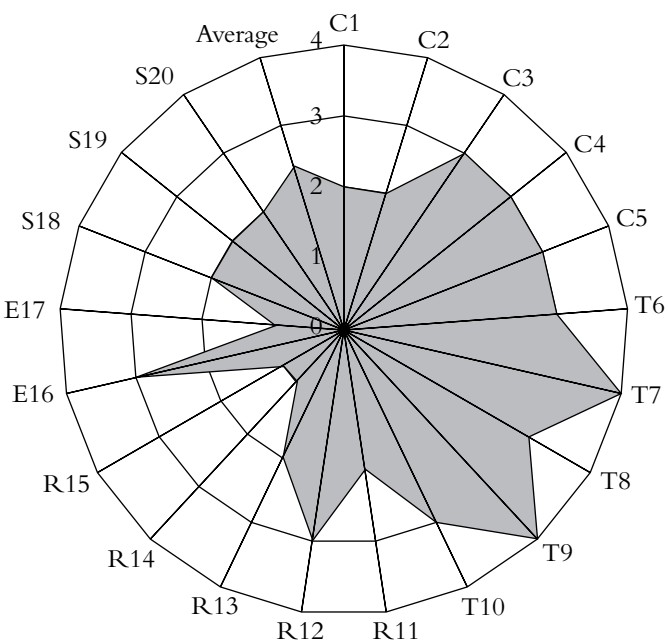
The department offers modules which address sustainable development issues. The Environmental Anthropology module focuses on the complex relationship between culture/society and nature/environment and the role of other social institutions like politics and economics in understanding environmental issues (Environmental Anthropology course guide, 2007). Among other issues, Anthropology of Tourism looks at the impact of tourism on local economies, culture and society (Anthropology of Tourism course guide, 2007). The People and Parks module is concerned with the complex relationship between people living within or close to parks and parks which in this case refer to 'all kinds of "natural" areas' which could be 'World Heritage Sites, national, provincial, urban and privately owned, as in game farms' (People and Parks Course Guide, 2007:1). The course explores the implications of the concept of sustainable development in the management of parks, as administrative policy has

gradually changed from an inhumane policy which dominated nature conservation and is being re-oriented towards rational access for residents and exploitation and sustainable use of park resources for local community development. Owen (n.d.) called anthropology 'a people-driven discipline' and evidence from the course guides show that the department places people at the centre of its activities. This department approaches sustainability issues from the point of view of how sustainability issues affect people. The 2007 examination papers for the mentioned courses show evidence of examination of the sustainability issues taught during the course (Anthropology of Tourism examination paper, 2007; Environmental Anthropology examination paper, 2007; People and Parks examination paper, 2007).

There are research activities taking place in the area of sustainability, as evidenced by the USAT results. Examples of sustainability issues researched/being researched by students include studies of how people obtain *muti* plants and the trade in those plants, tourism-related issues, people environments and medicinal plant use, to mention a few (Participant 1, pers. comm., December 2007). Some of their projects also reach out to communities. One example is a past interdisciplinary, collaborative research project by one of the staff members in the Dwesa-Cwebe region in the former Transkei, where local residents successfully campaigned for access to the Dwesa-Cwebe Nature and Marine reserve and were granted their land claim in 2001 (Owen, n.d.).

High scores in the teaching approach cluster of indicators suggest that the department is utilising teaching techniques which are said to promote the necessary skills for a sustainable

Figure 2. Sustainability performance of the Anthropology Department



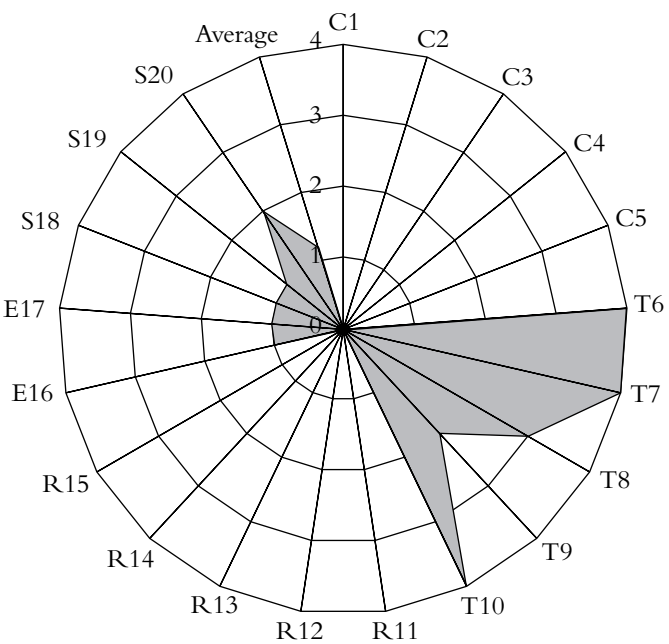
society (Figure 2). Its staff members can and are willing to teach, supervise and research sustainability issues (Participant 1, pers. comm., December 2007).

The Accounting Department

The Accounting Department had very low performance scores across all indicator clusters except teaching approach. All the indicators belonging to the curriculum and research clusters scored 0. Examinations and staff clusters were rated 1, except for S20 which scored 2. The average score for the department was 1.2 (Figure 3).

From the interviews, it was established that the department does not specifically teach sustainable development topics. They create awareness of these issues in Auditing and Financial Accounting when they teach students how to prepare financial statements, the tax effects of trading and how to audit that information (Participant 2, pers. comm., December 2007). Companies that are in resource-intensive operations like forestry or mining use natural resources and therefore face the question of conforming to regulations regarding their environmental impacts and rehabilitation. Financial statements therefore need to make provisions for such costs which may only occur years later. These financial statements are interpreted by different stakeholders, including environmental movement groups who may be interested in looking at the restoration processes in place. While these issues are not taught directly in courses, students have exposure to rehabilitation provisions through preparation of financial statements, thus capacitating them to pick up environmental accounting issues once they are in the work environment. Though they do not necessarily get the knowledge or understanding of what

Figure 3. Sustainability performance of the Accounting Department



the fundamentals entail, at least awareness is created (Participant 2, pers. comm., December 2007). Courses with sections on provisions include Financial Accounting 1, Accounting 2 and Accounting 3 (Rhodes University Calander, 2007). The department offers Ethics as a course and it has a section which deals with corporate social responsibility, a concept directly related to sustainability issues. The approach of the department is therefore to address sustainability issues as far as they affect the financial well-being of companies. In addition, the students have an awareness of other environmental issues outside the department through Economics; and requirements of certain acts (e.g. for land restoration/rehabilitation) through Commercial Law.

The major factor inhibiting the department's response to sustainability issues is the curriculum which they follow. It follows the curriculum of the Institute of Chartered Accountants, which is said to have too many requirements and is so demanding that there is just no space to fit anything else in to the curriculum. There is even a task team trying to address ways of reducing the curriculum's demands (Rhodes University Calander, 2007). The other problem is failure by the department to attract staff members. The department's research is generally in the field of taxation and there is nothing which deals with sustainable development. The department also did not have any community engagement initiatives at the time of the interview. This was however not due to a lack of interest or expertise (Figure 3), but as a result of staff shortages (Rhodes University Calander, 2007).

Discussion

Evidence from the study shows discrepancies in levels of integration of sustainability issues among the three departments. At the same time, the issues being addressed by these departments and the approaches used are also different. Differences in levels of integration of sustainability issues could be due to variations in the disciplines that in turn dictate the core teaching and research activities in each department. Thus, each department accommodates sustainable development issues as far as they interrelate with the core purpose and orientation of their discipline, while guarding against loss of focus or from too much divergence from its core mission. The Department of Ichthyology and Fisheries Science is concerned with the study of fish and fish environments, and sustainability of both is part of its mission. This may explain the high scores from the USAT evaluation. The strong biological focus of the department shows that it uses an ecological approach in addressing sustainability issues through which relevant social and economic issues are contextualised.

The main concern in the Anthropology Department is people, and sustainability issues are regarded in as much as they affect people (positively or negatively). Putting people's well-being first shows that the department addresses sustainability from a social angle. The Accounting Department, by mainstreaming only those sustainability issues which affect the financial well-being of the company in question, takes yet another stance which is more of an economic rather than either social or ecological approach.

The way the three departments approach sustainability is different to such an extent that it seems to be due to differences in appreciation of the dimensions of sustainable development. Variations in levels of integration of sustainability issues may be a result of differences in the

nature of the disciplines in terms of accommodating such issues. The disciplines also seem to be allowing for particular approaches in addressing sustainability issues and at the same time restricting the kind of issues to be addressed. In the Accounting Department, other factors like the mentioned staff shortages may have played a role in the low scores obtained across the indicator clusters. This situation does not provide insights into how best to approach issues of mainstreaming sustainability, or what sustainable development issues are relevant and/or a priority in the university's context, but it does indicate that diversity of interpretation and disciplinary orientation are likely to affect the mainstreaming process.

In addressing sustainability, multi-disciplinary approaches are important given the contested, controversial and multi-dimensional nature of the challenges. There is no simple solution to sustainability and diversity of approaches is crucial – to be valued in complex adaptive systems oriented towards resolution of socio-ecological and sustainable development issues (Folke, 2006). Folke (2006) argues that patterns of interaction can emerge from disorder through rules that guide change. Arguing along almost similar lines with Folke (2006), Wals (2007) maintains that diversity and contradictions can provide learning opportunities in ESD and social learning for sustainability owing to the complex nature of sustainable development challenges. Diversity can therefore be a necessary condition in the development of a system as it allows for depth and engaged interactions. Such interactions may result in system elaboration and re-organisation, things which may not have taken place if the system was in equilibrium.

What may be necessary is to look into issues of developing a shared understanding of sustainable development and defining priority sustainability issues in the university's context. Disciplinary capabilities can then be taken advantage of in contributing towards common sustainability objectives. This would see departments at the university working as components of a system with a shared goal where sustainability issues are concerned. The idea is not to force departments to work on similar sustainability issues or to use similar approaches. What may be needed is a contextual redefinition of sustainability goals to which each department will then contribute in its unique way. From the three cases, one may, for example, ask how each department with its disciplinary orientation to sustainability would be able to contribute to, for example, resolution of critical sustainability issues at a wider societal level such as climate change, loss of ecosystem services, a lack of social justice in resource flows and production economics, HIV/AIDS, or water scarcity. One could use examples of issues affecting southern Africa, South Africa and the Makana District (the immediate environment surrounding Rhodes University).

Results of the USAT give a good indication of the amount of sustainability work going on within departments. The tool was quick and easy to use and had the advantage of being unit-based; which, in the teaching departments, enabled assessing sustainability in only the selected departments as a starting point for assessing integration of sustainability issues across the university. Results were easy to represent graphically and to interpret, and indicators with low scores can be quickly determined. Comparing performance among different departments is also possible. General trends across departments can also be established, e.g. one can quickly notice that the teaching approach cluster of indicators obtained high scores in all three departments. In investigating a systems approach to mainstreaming sustainability issues by the university, this will provide a good guideline of the current state of mainstreaming activities.

The USAT does, however, not give an indication of the aspects of sustainable development integrated by these departments. The scores are not representative of the performance of the departments in relation to a wider framework of sustainability challenges as each department was rated within the confines of its discipline. A good example is the Department of Ichthyology and Fisheries Science where USAT results show that sustainability issues are highly integrated in departmental activities. Content analysis also revealed that it is an integral part of their mission. However, their focus is on fish and fish environments, which is only a fraction of the ecological dimension of sustainable development issues. The USAT does not show that it's only one dimension of sustainable development that has been integrated. The USAT is also subjective as it is based on the opinion of the assessor. The study thus employed interviews and content analyses of documents to complement and triangulate data from the USAT.

Sustainability assessments should go beyond the empirical level of reality, which only reveals what is happening at the surface, to consider what is not happening, as this maybe a good guide to unravelling issues that are important but are not being addressed. As explained by Sayer (2000), this may help in discovering unexercised mechanisms that can be activated – in this case to improve the sustainability performance of the university. Examples of such unexercised mechanisms in the case of the Accounting Department include a willingness to participate in sustainability-related community engagement activities and the existence of staff expertise in sustainability issues, both of which are not being taken advantage of as a result of other inhibitive factors such as staff shortages.

The study does not give answers to the question of how to promote institution-wide mainstreaming activities of environment and sustainability issues. Instead, it discloses differences in levels of integration of sustainability issues and in approaches being employed by departments within the university. It divulges the contested and controversial nature of sustainability issues even at such a small scale. It should be a challenge to the university to find a way for the departments to work with sustainable development in a deliberative way.

Conclusion

While the three departments examined are approaching the sustainability question from varied angles, the study has shown that there is capacity in these diverse disciplines to contribute in their different ways to sustainable development issues. All three disciplines have something to offer by way of contribution to mainstreaming environmental and sustainability issues. Even though their approaches differ, they each touch more or less on all three major dimensions of sustainable development; that is, ecological, economical and social dimensions. The university can therefore take advantage of these efforts in promoting mainstreaming activities. The current *modus operandi* is, however, not holistic and hence leaves room for disciplinary tensions within the university over approaches and priorities. This is one of the systemic challenges that the university faces if mainstreaming of these issues is to be promoted as an institutional initiative. Theory associated with complex adaptive systems and social learning proposes that such tensions may be productive advocates for change and responsiveness (Folke, 2006).

There is need to create a mutual understanding of what sustainable development means and entails within the context of the university.

The university also faces the challenge of addressing problems faced by individual departments in mainstreaming sustainable development issues (such as staff shortages) in order to further develop the capacity of these departments to work with sustainability issues relevant to their disciplines and to wider society. It should deal with obstacles inhibiting the realisation of some of the interests of individual departments and at the same time take advantage of initiatives in place. Individual departments could also make an effort to create capacity within their disciplines to accommodate sustainability issues. The university is also challenged to build further synergy from what may seem to be isolated and fragmented departmental efforts. At present there are various initiatives in place to do this; such as the co-ordination of a Makana Research Group, which is looking at what overlaps and synergies exist between departmental research initiatives and sustainable development issues in the Makana District, and a community engagement co-ordination process, which is seeking to identify synergies between diverse community engagement initiatives established by different departments and units in the university. This study, and its investigation of a systems approach to mainstreaming environment and sustainability at Rhodes University, represents another similar intervention.

Notes on the Contributor

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Endnote

1. This paper forms part of a more in-depth PhD study involving a larger number of departments, research units, student activities and co-ordination mechanisms at Rhodes University, which is used as a case study for exploring the potential of a critical realist orientation to systems thinking for mainstreaming environment and sustainability in African universities (Togo, forthcoming).

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Promoting Stakeholder Participation in a Learning-Based Monitoring and Evaluation Framework

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Abstract

This research analysed monitoring and evaluation activities based on the Outcome Mapping methodology within the Zimbabwe Secondary Teacher Training Environmental Education Project (St^{2}eep), an education for sustainability initiative in Zimbabwe. The majority of donor-funded environmental education programmes use conventional monitoring and evaluation approaches based on the logical frameworks (logframe) that guide the programme designs and management. Although research indicates significant problems with the implementation of these approaches, there are only a few documented examples of experiences with alternative monitoring and evaluation frameworks. The case of St^{2}eep allowed us to compare three years of experiences with monitoring and evaluation based on the logframe, with two years of monitoring and evaluation based on Outcome Mapping.

We evaluate how the project team and the donor organisation, VVOB (the Flemish Office for Development, Cooperation and Technical Assistance), have perceived the performance of Outcome Mapping with regards to the two main aims of monitoring and evaluation activities: accountability and learning. This is complemented with an analysis of monitoring documentation. The project team refers to the collaborative nature of monitoring and evaluation in St^{2}eep, the principles of self-assessment and peer-assessment, combined with public recognition for project successes, as the key factors supporting learning and accountability through monitoring and evaluation in St^{2}eep. The Outcome Mapping-based monitoring and evaluation system is shown to enhance ownership and participation of local stakeholders in the project's monitoring and evaluation system.

Introduction and Background

The Zimbabwe Secondary Teacher Training Environmental Education Project (St^{2}eep) started in January 2003 and is a partnership between the Ministry of Higher Education, three teacher training colleges and the Flemish Office for Development, Cooperation and Technical Assistance (VVOB). St^{2}eep supports the implementation of national environmental education policy within three secondary teacher training colleges in Zimbabwe. Project activities are

coordinated by college based coordinating teams that work on a voluntary basis and consist of three lecturers in each of the three colleges. These three coordinating teams make up the St^{2}eep project team which is responsible for the management of the project. We refer to this particular team whenever we mention 'project team' in this paper. The main stakeholders of the St^{2}eep project include college lecturers, college administrations, pilot schools, the Ministry of Education, and the donor organisation (VVOB).

During its first phase (2003-2004), St^{2}eep has provided support towards the development of environmental education guidelines for secondary teacher training (St^{2}eep, 2005a), college-based environmental education activities, building environmental education capacity of lecturers and developing functional environmental education resource centers in the colleges. Between 2004 and 2008, St^{2}eep has put an increasing emphasis on the institutional environment in which the environmental education processes take place and has focused mainly on continuous professional development of college lecturers and integration of environmental education in the various subject areas offered in secondary teacher training colleges.

Until mid-2005, St^{2}eep's operations were guided by the logical framework approach or logframe. The logframe is the most widely used framework to plan, monitor and evaluate donor-funded development programmes and draws from a positivist approach towards the process of development (Morgan, 2005). It goes along with instruments, tools and procedures derived from the positive science and engineering sector and is characterised by breaking up a programme into predictable, logical and sequential activities to be achieved in a given time span. It is result-oriented and aims to enhance control and efficiency (Morgan, 2005).

However, after an in-depth self-reflection exercise (St^{2}eep, 2004; Van Ongevalle *et al.*, 2005), it was found that the Planning, Monitoring and Evaluation (PM&E) framework was mainly used by the VVOB staff to meet the official budgetary and reporting requirements from the VVOB head office. Local partners were not involved in the monitoring and reporting process. Hence, the logframe and the associated monitoring and evaluation processes were divorced from the project and did not really influence or inform future planning.

This perceived gap between generating information through monitoring and evaluation and using it for future planning is an often acknowledged absence of mechanisms for learning in the design of monitoring and evaluation systems when using the logframe (Britton, 2003; Horton *et al.*, 2003). The logframe has the advantage of emphasising the importance of the planning cycle, but its rigidity makes it difficult to apply a learning approach that requires openness to the unexpected and flexibility to embrace change (Britton, 2005; Horton *et al.*, 2003).

During the first three years of St^{2}eep, an informal, unsystematic and more process-oriented monitoring and evaluation system emerged. This system was characterised by participatory self-assessment workshops and discussion sessions during planning meetings and project activities where key stakeholders were given an opportunity to express their views, negotiate meaning, learn and plan towards the future. The learning in this informal monitoring and evaluation system highlighted the need for a more participatory and learning oriented planning, monitoring and evaluation system to guide the second phase of the project (Deprez & Van Ongevalle, 2006; Van Ongevalle, 2007). As a result of these insights, Outcome Mapping was

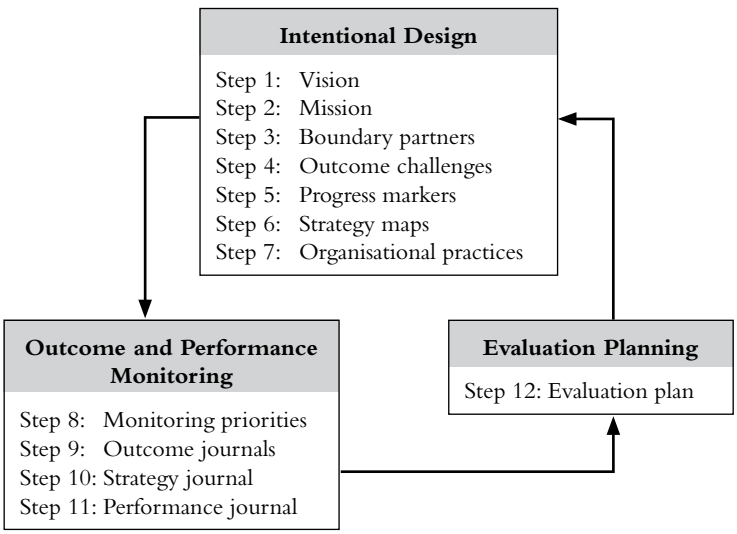
chosen by project stakeholders as project management system as it seemed to be more learning centred and participatory than the original logical framework approach.

Outcome Mapping as a Learning-Oriented Project Cycle Management Framework

The evaluation unit of the Canadian International Development Research Centre (IDRC) developed the Outcome Mapping methodology because it had encountered fundamental challenges in assessing and reporting on development impact (Earl, Carden & Smutylo, 2001). While development organisations are under pressure to demonstrate that their programmes result in significant and lasting changes in the well-being of large numbers of their intended beneficiaries, such 'impacts' are often the product of a confluence of events for which no single agency or group of agencies can realistically claim full credit. As a result, assessing development impacts, especially from the perspective of an external agency, is problematic. To address this challenge, a methodology called Outcome Mapping has evolved that characterises and assesses the contributions development programmes make to key partners the programme is trying to influence or trying to capacitate. It takes a learning-based and use-driven view of evaluation guided by principles of participation and iterative learning, encouraging evaluative thinking throughout the programme cycle by all programme team members.

Central to Outcome Mapping is the concept of outcomes, defined as 'changes in the behavior, relationships, activities, or actions of the people, groups, and organisations with whom a program works directly' (Earl *et al.*, 2001). The programme cycle in Outcome Mapping consists of three phases: (1) intentional design, (2) monitoring planning, and (3) evaluation planning (see Figure 1). This framework was used to restructure the planning of the St^{2}eep project.

Figure 1. The three phases of the Outcome Mapping process



(Source: Earl *et al.*, 2003)

Using Outcome Mapping to Restructure the Planning of the St²eep Project

Phase 1: Intentional design

The operational restructuring of planning of St²eep through the Outcome Mapping intentional design was done during an Outcome Mapping workshop attended by various project stakeholders in May 2005 (St²eep, 2005b). This re-planning process started with a dialogue on the development of a vision and a mission for the programme, followed by a stakeholder analysis and an identification of the boundary partners (see Table 1).

Table 1. New St²eep vision and mission and boundary partners

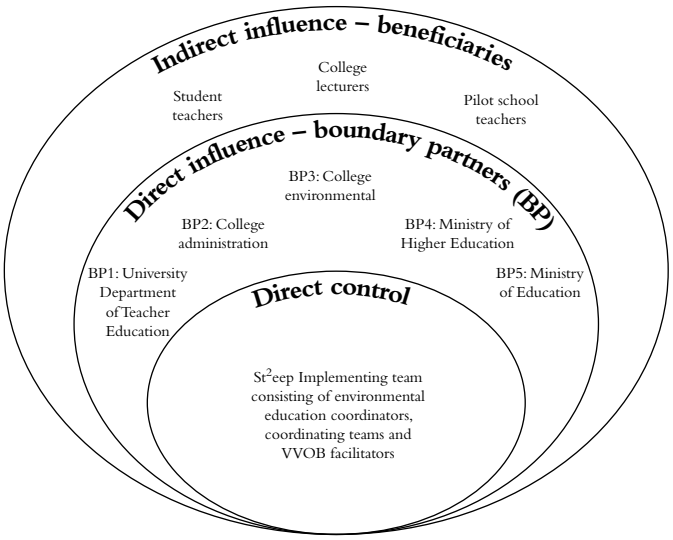
Vision	Mission	St²eep's boundary partners
Education in Zimbabwe is reoriented towards critical thinking, action competence and responsible behaviour by individuals and groups to achieve sustainable living in a healthy environment. In this way, the Zimbabwean community is empowered to make informed individual and collaborative decisions, which will ensure continual effective environmental management.	In support of this vision, St²eep will create an enabling environment for sustained environmental education implementation in Secondary Teachers' Colleges through the encouragement of active learning processes which promote participation, critical thinking, informed decision-making, action competence and responsible citizenry. St²eep will conduct ongoing pre- and in-service capacity enhancement, curriculum review and implementation, and strive for the reorientation of assessment of teaching and learning in line with principles of environmental education. St²eep will lobby for motivational strategies and policies to ensure that environmental education is institutionalised in the education system and encourage outreach programmes through networking with schools, communities and environmental interest groups. St²eep will ensure that graduates of the secondary teachers' colleges are able to implement environmental education in their teaching.	• Environmental education steering teams • College administrators • Ministry of Higher Education • Department of Teacher Education • Ministry of Education

An important assumption underlying Outcome Mapping is that local structures (boundary partners) control change. 'Boundary partner' is a crucial concept in Outcome Mapping, and is defined as those individuals, groups or organisations with whom the programme interacts directly and with whom the programme can anticipate opportunities for influence (Earl *et al.*, 2001). External agents, like development programmes, 'only facilitate the process by providing access to new resources, ideas, or opportunities for a certain period of time' (Earl *et al.*, 2001:2). Using Outcome Mapping allowed St²eep to centre its project logic around its boundary partners, and not around the desired final change of state (e.g. environmental education integrated in the subjects, environmental education learning materials produced, environmental

education resource centres operational), as in the original logframe. By thinking in terms of influencing endogenous actors (boundary partners), Outcome Mapping integrates sustainability thinking and capacity development processes directly into the design of the programme. A linear cause and effect relationship is replaced in Outcome Mapping by a view of development as a complex process that occurs in open systems (Van Ongevalle, 2007).

The three circles in Figure 2 illustrate the different players in St^{2}eep and their relationship (control, direct influence, indirect influence).

Figure 2. Relationship between different stakeholders in St^{2}eep



(Adapted from Earl *et al.*, 2001)

The equivalent of logframe indicators in Outcome Mapping are called progress markers, and are developed for each boundary partner in dialogue between the project team and the boundary partner. They provide a graduated set of statements describing a progression of changed actions of the boundary partner. In contrast with the SMART (specific, measurable, achievable, realistic and time-bound) indicators in the logframe approach, they do not represent targets to be reached, but rather points of reference to motivate stakeholders' reflection, learning and consensus, and to guide their actions and interaction (Ortiz, 2004). Table 2 illustrates a set of progress markers of one of St^{2}eep's boundary partners.

Phase 2: Using outcome mapping for monitoring and evaluation planning

A two-day workshop was organised in December 2005 to develop St^{2}eep's monitoring and evaluation system based on outcome mapping (St^{2}eep 2005c). The monitoring and evaluation framework of Outcome Mapping is based on principles of (1) monitoring via self-assessment (by the programme stakeholders), (2) encouraging feedback, reflection and learning, (3) promoting internal and external dialogue, and involves (4) following-up on unintended

effects. This is operationalised through three parallel monitoring processes stimulating critical reflection about:

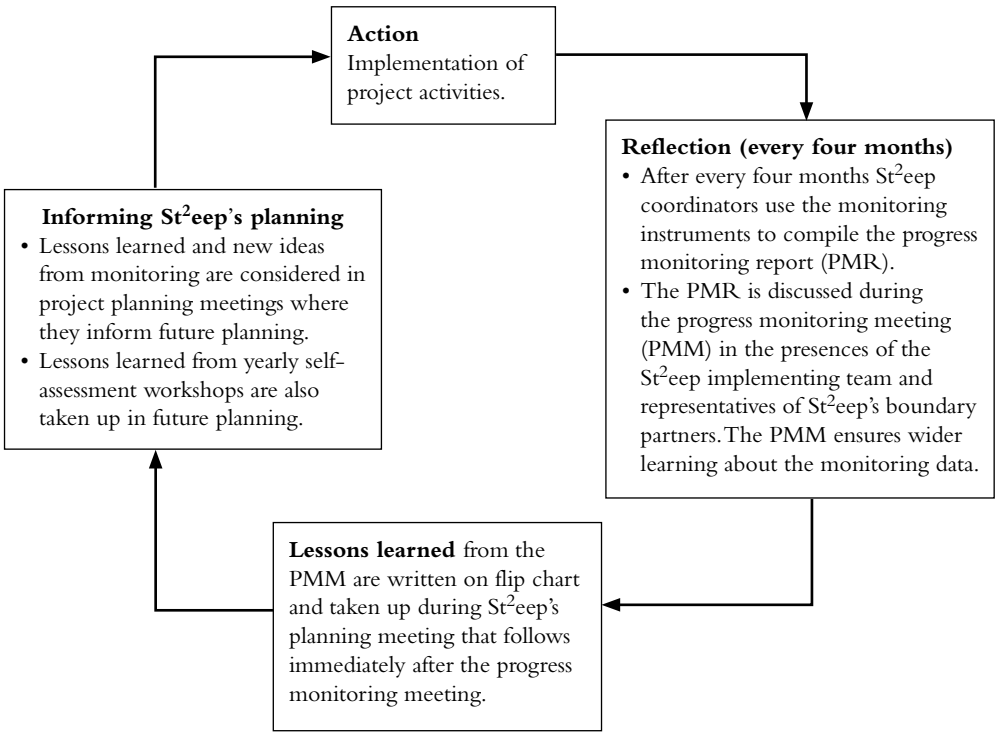
- The strategies carried out by the St^{2}eep implementation team in support of the boundary partners.
- The observations on the changes in actions (i.e. progress markers) of the boundary partners.
- The internal performance of the programme.

Outcome Mapping provides specific instruments such as strategy journals, outcome journals and performance journals that assist data collection about these processes.[1] It also provided St^{2}eep with guidelines for developing a monitoring and evaluation plan that promotes learning from the monitoring data (St^{2}eep, 2005c). Yearly self-assessment workshops constitute the main process of learning-based project evaluation of the project's internal performance. Figure 3 illustrates St^{2}eep's planning and monitoring and evaluation cycle, which consists of four-monthly cycles of progress monitoring, reporting and reflection meetings. Lessons learned from the monitoring feed into planning for the future activity period.

Table 2. Set of progress markers to monitor changes in behaviour of college administrations

Boundary Partner: College Administrations	
St^{2}eep expects to see the college administrators:	
2	Providing office space and equipment for the environmental education coordinators.
3	Authorising lecturers to participate in environmental education activities.
4	Chairing the National Management Team.
5	Facilitating a reduced teaching load for the college coordinators.
St^{2}eep would like to see the college administrators:	
6	Attending environmental education activities.
7	Supporting college environmental education policy development and implementation.
8	Providing transport, finances and other resources for environmental education activities.
9	Including and positioning environmental education high on the agenda of staff meetings.
10	Including and positioning environmental education high on the agenda of academic board meetings.
St^{2}eep would love to see the college administrators:	
11	Incorporating environmental education in the college strategic plan.
12	Appointing full time environmental education coordinators.

Figure 3. The planning and M&E cycle for St^{2}eep



(Adapted from Deprez *et al.*, 2007)

Research Method

The research in this paper aims to gain insights into the monitoring and evaluation process that was developed on the basis of Outcome Mapping in the St^{2}eep project. The case of St^{2}eep allowed us to compare three years of experiences with monitoring and evaluation, based on the logframe (2003-2005), with two years of monitoring and evaluation implementation, based on Outcome Mapping (2006-2007). Therefore, a qualitative case-study design was selected as methodology for the research. The following research questions were put forward:

1. In the context of St^{2}eep, how is the new monitoring and evaluation system performing in the area of team/organisational learning?
2. How is the new monitoring and evaluation system performing in the area of accountability?

The field work for this research was done by one of the authors (Van Ongevalle) who is employed by the donor as the lead facilitator of the St^{2}eep project. Document analysis was mainly carried out by Huib Huyse who, as country representative of the donor organisation, had the St^{2}eep project in his portfolio from 2003 to 2007. This of course raises a number of

epistemological issues, notably the difficulties in researching your own working environment and, more specifically, processes that you have initiated yourself, as this can be challenging in many ways since it requires ongoing reflexivity (Van Ongevalle, 2007). When collecting data from interviews with project beneficiaries, for example, it is up to the practitioner-researcher to try to assess to what extent answers to critical questions will be influenced because of donor-recipient dynamics. The trust relationship that has been built up over the years within the project team makes it possible to discuss many things in a frank and critical way, but it remains a point of attention (Van Ongevalle, 2007). Also the St^{2}eep project embraces a research orientation, and various studies have been done in the context of the project already, so it is not an unusual experience (Chimbodza, Van Ongevalle & Madondo, 2004). Abbott, Brown and Wilson (2007) argue that reflections and research by development managers can form the basis of transformations in learning if they embed their reflections within their work and develop their relations with other stakeholders beyond operational management challenges towards joint learning opportunities. Different forms of triangulation of data – for example, by interviewing different groups within the project, comparing these with results of participant observation, and asking outside experts to review certain data and findings (like monitoring and evaluation reports) – did not only increase the validity of the research, but also gave additional insights in the processes at hand. Working with a research team (the co-authors of this paper) has also helped to enhance the rigour of the research.

An analysis of project documents involved a review of six progress monitoring reports (PMRs) over the period 2003-2007. They were analysed in terms of: (1) presenting a balanced account, (2) readability, and (3) clarity on responsibilities and duties. This allowed the authors to probe the performance of St^{2}eep's monitoring and evaluation in terms of reporting and accountability. A survey questionnaire capturing experiences with the monitoring and evaluation system was completed by key stakeholders (two lecturers and one donor representative) in the project. The information that emerged from the small-scale survey was used to prepare a semi-structured interview for use within a focus group with three other key stakeholders of the St^{2}eep project. Via participant observations during monitoring meetings over the period 2003-2007, additional data was produced on the monitoring and evaluation processes and the group dynamics associated with the Outcome Mapping methodology. We use extracts from various data sources throughout the paper to illustrate our arguments. 'PMR' refers to progress monitoring reports and is followed by an indication of the year when the report was written. The letters 'S' and 'I' refer to survey and interview extracts respectively, with particular numbers referring to specific individual respondents.

Summary of the Research Findings

Outcome Mapping and learning

The rich metaphor of organisational learning as a 'crime' (Britton, 2005) provides us with an interesting framework to investigate whether St^{2}eep's monitoring and evaluation system provides the minimal requirements for organisational learning. In other words, does St^{2}eep's monitoring and evaluation system provide a 'motive', the 'means' and the 'opportunity' for

organisational learning to take place? And how do people learn within St^{2}eep's monitoring and evaluation system?

Does Outcome Mapping provide a motive for learning?

The involvement of local stakeholders in the monitoring and evaluation processes can be witnessed in several ways. For example, different St^{2}eep teams from the various colleges fill in the progress monitoring instruments on a quarterly basis and deliver PowerPoint presentations at the monitoring meetings with boundary partners. Outcomes from the semi-structured survey and focus group interview provide some insight in what motivates St^{2}eep members to be actively involved in the monitoring and evaluation processes:

- S1: 'It allows my college administration to see what I have achieved in environmental education, which is one of my college duties.'
- S1: 'it becomes embarrassing at monitoring meetings when certain agreed programmes are not undertaken.'
- S2: 'I participate because of the conducive atmosphere which allows free participation and values individual opinions.'
- S3: 'For the coordinators it gave some confidence to see that some of their problems were not specific to them or their college but could be widespread'
- I1: 'Leads to "activation" of the boundary partners, which is very motivational'
- I1: 'There is strong peer assessment. … This resulted in strong improvement in one college and colleagues admitting embarrassment [for failing to do what was agreed upon] outside the meeting.'

The data show that St^{2}eep members enjoy the group recognition of individual or group achievements during monitoring meetings. At the same time they find it reassuring that problems can be discussed in a non-threatening atmosphere, where suggestions for future planning can also be formulated. This safe environment allows for peer assessment which strengthens accountability among project partners.

Does Outcome Mapping provide the means for learning?

Using Outcome Mapping, St^{2}eep developed a two-way monitoring system. St^{2}eep monitors the changes in behaviour and actions of its boundary partners. Accordingly, the boundary partners are able to give feedback about the support strategies implemented by St^{2}eep during the monitoring meetings. The monitoring reports are also presented during management meetings in which key boundary partners participate. In this way, the monitoring process and results are used as a tool for reflection and learning and inform decisions on future planning and action. Finally, the various lessons learned from the monitoring process are compiled into one report which is sent to project stakeholders. Table 3 shows an extract from an outcome journal which is one of St^{2}eep's progress monitoring instruments. The bullets describe changed behaviour (in the form of actions) of the environmental education steering teams in the colleges (one of the boundary partners) that St^{2}eep observed during a specific monitoring period.

Table 3. Extract from the progress monitoring instrument of term 1 (2007) showing observed changes in one of St^{2}eep's boundary partners, i.e. environmental education steering teams

Description of the changes for this period for the environmental education steering teams
National level • Supporting lecturers with environmental education implementation through Environmental Education Action Support Team (EEAST) workshops organised by steering teams. • Steering Teams facilitated in the livelihoods programme to enhance food security through the empowerment of schools in five districts of Zimbabwe. • Greater involvement in planning and execution of environmental education workshops by steering teams. **Belvedere Technical Teachers College level** • Assisting lecturers to identify their needs and expected support for environmental education implementation. • Supporting lecturers with environmental education implementation through EEAST workshops. • Empowered some pre-service teachers to incorporate environmental education in their teaching. • Participated in the livelihoods programme for orphaned and vulnerable children in five districts of Zimbabwe. • Successfully carried out college community environmental education awareness workshop.

The use of the progress monitoring instruments and the monitoring meetings are characterised by team work and are perceived by the project team as making the monitoring and evaluation process more systematic and based on actual facts instead of individual assumptions. They also enhance individual competencies, and build interpersonal relations and trust. Extracts from surveys and focus group interviews illustrate these observations:

- I2: '[PMR instruments provide] clear guidelines on what to monitor.'
- S3: '… using the PMR instruments brought focus to the exercise. Without the PMR instruments this was not done in any systematic way but more anecdotally … This often left out important points. Progress monitoring reporting is helpful in planning because it points our critical areas…. Through presentation and discussion issues were clarified and there was usually immediate follow-up to look at the way forward.'
- S3: '…makes people think about the project, … [progress monitoring reporting] helps to uncover problems within the running of the project … [the] document is structured but leaves room to report freely on issues through the narrative reports … [A] section to specifically bring out unanticipated changes encourages people.'
- I1: '…[progress monitoring reporting exposes] people's expectations against ground experiences – [it is] based on factual data instead of assumptions.'

People involved in the monitoring and evaluation process also go through a process of individual capacity development in terms of monitoring and evaluation, as is illustrated by the following statement:

- I1: '… it is difficult for people to use the instruments if they are not familiar with the Outcome Mapping terminology … colleagues explain to each other …. [it] doesn't need an expert for monitoring and evaluation.'

Although very positive signals could be observed from the project team on how Outcome Mapping provides a supportive framework for learning, a review of the monitoring and evaluation reporting brings up a number of challenges. In the intentional design phase of Outcome Mapping, significant efforts are made to develop a coherent story that links strategies with progress markers and outcome challenges. It is our impression that the project team is challenged by the multitude of progress markers and strategies, and is not always managing to bridge the gap between everyday realities (activity-based) and the more long-term strategic thinking (overall progress). Although there is no need to monitor all progress markers at every monitoring session, the reporting on the boundary partners in the St^{2}eep process was not systematic in following up important progress markers. In addition, descriptions of changed behaviour were quite often vague and repeated in subsequent reports, with little contextual information and few references to tangible evidence. The following extracts from the PMRs of the first and second quarter of 2007 (PMR 1-2007 and PMR 2-2007) illustrate this:

- PMR 1-2007: '… increased use of environmental education resource centre by both students and lecturers.'
- PMR 1-2007: '… empowered some pre-service teachers to incorporate environmental education in their teaching.'
- PMR 2-2007: '… more interest in joining St^{2}eep activities and support of St^{2}eep.'

These examples illustrate how the project team is facing difficulties in qualifying and quantifying the observed changes against observations from earlier monitoring periods and presenting a story of change that makes sense for readers who were not involved in daily project activities. While some of this information is discussed in progress monitoring meetings and is available in the files and records of individual coordinators and facilitators, a systematic analysis of the overall changes in the boundary partners, as specified by the list of progress markers, seems to be missing, as does more in-depth theoretical and contextual interpretations of what these might mean in terms of development and educational objectives of the programme.

Does Outcome Mapping provide the opportunity for learning?

The data collected through the progress monitoring instruments are presented by the environmental education coordinators during four-monthly progress monitoring meetings. Linking St^{2}eep's progress monitoring meetings with project-planning meetings provides a learning opportunity where lessons learned from the monitoring and evaluation process inform planning and decision-making by the project management team, as is shown by the following extracts from interviews and survey questionnaire data:

- I1: 'Greater room during progress monitoring meeting to discuss, analyse, allowing informed planning during operational management meetings and developing factually loaded reports during national management meetings…'
- S3: 'Progress monitoring reporting is helpful in planning because it points to our critical areas … People are encouraged to be critical. If certain things have not been achieved, they are also brought out. Discussion then tries to get to the bottom of the case on why something did not work out. From this a better plan follows.'

Specific lessons learned, recommendations for future actions and action plans are captured during progress monitoring meetings and presented during management meetings where specific decisions for future action are taken.

Besides regular progress-monitoring reporting and meetings, each end-of-year evaluation includes a self-assessment workshop where the St^{2}eep team, its boundary partners and strategic partners engage in critical reflection. Elements of the self-assessment are determined in advance by the St^{2}eep team and may include St^{2}eep's internal performance towards relevance and viability of the project (i.e. St^{2}eep's organisational practices), leadership issues, partnerships and resources or a reflection on the intentional design of the project. The self-assessment workshop outcomes inform the yearly operational planning by the St^{2}eep management teams as reflected in the following extract from a survey questionnaire:

- S3: '… certain parts of the PMR instrument become outdated after some time while new items, not yet covered, may crop up. The system is flexible enough to review the document from time to time and make changes.'

Combining the motive, means and opportunity for learning in St^{2}eep's monitoring and evaluation system

It is the combination of the motive, means and opportunity for learning provided by St^{2}eep's Outcome Mapping-based monitoring and evaluation system that promotes learning within the project. Outcomes from the surveys and focus group interview provide insight on how St^{2}eep members experience this learning process:

- S1: 'I learn from others and they learn from me. I go back to college and improve on my weaknesses …'
- S2: '… getting insight in the running of the whole programme in general and not just the components.'
- S3: '… coordinating teams learn from each other. Approaches used in one college can be tried in another as well.'

The data show that there is an element of team learning whereby St^{2}eep members and boundary partners are able to learn from each other based on discussing issues that emerge from the monitoring and evaluation process. The principles of self- and peer-assessment in a non-threatening atmosphere combined with being able to celebrate successes and collaboratively look for answers to problems seems to strengthen the learning process by motivating people to become involved.

The fact that the monitoring framework focuses specifically on the project implementation team (strategy maps) and the boundary partners (progress markers), makes it easier to motivate St^{2}eep members and boundary partners in the monitoring and evaluation process. As a result, participation in the monitoring and evaluation activities strengthens ownership of the project and stimulates both St^{2}eep members and boundary partners to become actively involved in the project.

The problems with the rather vague descriptions and the lack of systematic analysis of the behaviour changes could be partly explained by the fact that not all the in-depth discussions in the meetings are captured in the reports, or it may also be a deeper underlying problem with behaviour modification assumptions in development logic. However, to increase the

learning curve of the monitoring process there would be a need to deepen the quality of the data collection, to unpack the progress markers into clearly defined changes of behaviour, and to push critical reflection at a higher level – including the systematic follow-up of which strategies seem to work and which don't in view of contributing to behaviour changes of the boundary partners. It may also require theoretical probing of the underlying assumptions of the Outcome Mapping approach. By focusing on the understandings, perceptions and behaviour of the people involved in the project, Outcome Mapping has shifted St^{2}eep's monitoring and evaluation system towards a more interpretive perspective instead of the functionalist perspective characterised by a linear planning logic of the logframe earlier in the the project. This requires monitoring and evaluation maturity on the part of the stakeholders involved, sufficient time and resources, and a supportive and critical framework. If those barriers to learning are not actively mediated, applying Outcome Mapping methodology will not really allow 'frank dialogue about successes and failures' (Ortiz, 2004), as is needed for successful Outcome Mapping implementation.

Outcome Mapping and accountability

St^{2}eep's monitoring and evaluation system was developed in such a way that the information generated through the various monitoring and evaluation processes would satisfy accountability requirements towards various stakeholders, e.g. the donor (VVOB), Ministry and college administrations (local authorities), the boundary partners and beneficiaries (lecturers and college students). In this respect we asked a number of St^{2}eep implementation team members to share their viewpoints about accountability and quality of reporting. We also asked an independent reviewer to critically look at the monitoring and evaluation reports and give her opinion on these issues.

A balanced account?

Members of St^{2}eep's coordination team felt that the PMR gives an objective and balanced account of the successes and challenges of the project. At the same time they highlight that the accountability to the donor is improved because VVOB gets monitoring data from various sources. They also indicate that the quality of reporting has improved because the report contains the viewpoints of different operatives, as is indicated in the following comments:

- S3: '… in the early stages the narrative reports were little developed. "Change" is a specific term in Outcome Mapping but not clear once used by people who no longer remember the special meaning or who were not part of the Outcome Mapping process … St^{2}eep definitely has a clear picture of its problems and successes. The process also seems to happen in a fairly honest way.'
- I2: 'Degree of objectivity is high – different people input in the report … not based on one individual … e.g. in one college, two members go through the report … draft circulated to other members who were able to input as well.'

Because the overall monitoring and evaluation process of St^{2}eep is a multi-stakeholder process with participation of various layers of the project, final reporting products can be considered

to provide a balanced account. Overall, accountability has increased with the introduction of Outcome Mapping in comparison with the logframe-based monitoring and evaluation system (where the main contributors were the development workers).

Readability of the monitoring documents

One of the VVOB development workers indicated that the quality of the report is improving over time with better narrative analysis included in the report. The external review of the progress monitoring reporting also found a learning curve in the readability of Outcome Mapping-based reporting over time. When compared with the initial logframe-based reporting (2003-2005) the situation becomes more complex. Because of the contributions of multiple persons to the Outcome Mapping-based monitoring and evaluation report, combined with the large quantity of information to be completed for each boundary partner, it is almost unavoidable that the readability of the report is hindered. The extremely condensed form of reporting by local stakeholders (often in bullet form and without contextualising) also decreases readability. Comparing the readability of the Outcome Mapping reports with logframe is complicated because the two processes and their intentions were so different. It is understandable that lecturers approach the report writing more pragmatically because all the work done for this project is done in addition to their usual lecturing duties (unlike for the development workers).

Concluding Reflections

There are signs that Outcome Mapping has made St^{2}eep's monitoring and evaluation cycles more learning oriented, making it more exciting, useful, relevant and transformative. In this paper we have illustrated why this is the case, and conclusions can be summarised as follows:

- Outcome Mapping methodology has helped to make the monitoring and evaluation process more actor-focused in its approach, enhancing motivation for learning. Ownership of St^{2}eep's monitoring and evaluation system, and of its programming, has become more endogenous, as environmental education coordinators in each of the colleges increasingly become the leaders of St^{2}eep and are able to clearly identify where their actions should be focused, further increasing ownership and results through the changed actions of the identified boundary partners. Outcome Mapping has also been able to draw the boundary partners into the monitoring and evaluation processes, which has resulted in a deeper understanding of their expectations and responsibilities, has strengthened their partnership with the project team and has enhanced their commitment towards the project.
- The application of Outcome Mapping in St^{2}eep has stimulated the project team to craft a monitoring and evaluation system that provides useful monitoring and evaluation tools (learning means) and offers specific learning spaces (opportunities for learning) for meaningful dialogue and reflection on the progress of the project. Because of the strong local leadership in the organisation of these learning spaces, the learning practices employed are more based on a learning style that is relevant to the cultural context of

the local practitioners (Britton, 2005). The strong feeling about the motivating effect of monitoring and evaluation meetings that provide a non-threatening space for team learning through critical reflection and inspired by elements of self- and peer-assessment reported on above, provide evidence for this argument.

- We also observed a major challenge in St^{2}eep's Outcome Mapping-based monitoring and evaluation system. Outcome Mapping seems to assume a higher level of monitoring and evaluation maturity than in logframe monitoring, and that could possibly be expected in the St^{2}eep context. We observed that the project team is challenged by the multitude of progress markers and strategies, and how to bridge the gap between the reality of the day (activity-based) and the more long-term strategic thinking (overall progress). These observations pose a challenge for both accountability and deeper learning about the broader change processes that the project is trying to influence. We also noted a need to probe the assumptions of Outcome Mapping theoretically since they are based on behaviour-change assumptions which have also been the subject of critique in social theory, and indeed in environmental education.[2]

In order to continually strive for a balance between accountability and learning, this case study concludes by summarising two key questions a project, programme or organisation could ask itself, based on St^{2}eep's experience:

- Is there enough monitoring and evaluation maturity on the part of the monitoring and evaluation implementers to fully exploit the advantages of an Outcome Mapping-based monitoring and evaluation system, and at the same time to reflexively critique its underlying assumptions of social change? The St^{2}eep case has shown that while Outcome Mapping helps to promote local ownership of the monitoring and evaluation process, this does not automatically translate into adequate monitoring and evaluation capacity to ensure that all learning and accountability needs are met. Development of monitoring and evaluation capacity is a process that may need active support that could be included in future operational plans.
- Do the various stakeholders have a shared understanding about the learning and accountability needs that the Outcome Mapping-based monitoring and evaluation system seeks to address? In the case of St^{2}eep, the project coordination team was not aware that all learning and accountability needs were not fully met. They were also not fully realising that they could learn more about the overall progress of the project by monitoring specific change processes more systematically. A clearer strategy on what data has to be collected when, for each progress marker, would support this idea. Also, regularly checking if all internal and external accountability and learning needs are met by the monitoring and evaluation system through feedback from various stakeholders could be helpful.

Finally, all of the effort being put into Outcome Mapping approaches to monitoring and evaluation would have little meaning unless they could show outcomes in terms of the

development of environmental education theory and practice, a question which remains to be answered in another paper (i.e. how such an approach to project management and evaluation has outcomes in terms of field-related praxis).

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Endnotes

1. St^{2}eep's progress monitoring instruments and monitoring and evaluation plan can be accessed on http://www.outcomemapping.ca/resource/resource.php?id=109
2. See, for example, Robottom (1987) who was one of the earliest authors to alert the field to the problems associated with behaviour change assumptions in environmental education.

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Viewpoint
Environmental Justice: Order-words and pass-words

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Abstract

Environmental justice, along with constructs such as environmental rights, has gained prominence in environmental discourse over the last three decades. These constructs have also migrated into education discourses including education policies. In South Africa environmental justice is a component of one of the key principles supporting South Africa's recently implemented National Curriculum Statement. Despite these developments, there is still uncertainty as to what environmental justice means. Vincent (1998) analyses the term and concludes that it is a double category error since it does not rest well with either environmental theory or justice theory. I suggest that the angle of vision should shift from a focus on what environmental justice means to a focus on what it does and what it produces.

Introduction

Conceptions of environmental education have and continue to change. Changing conceptions of environmental education reflect pendulum swings from anthropocentric to ecocentric orientations to human-nature relationships. The concept 'environment' itself has expanded from a narrow reference to only the biophysical dimension to one that includes interacting economic, political and social dimensions. In recent years we have witnessed the (re)emergence of environmental (education) discourses that appear to have strong anthropocentric leanings. I refer here to notions such as environmental rights (a subset of human rights) and environmental justice (a subcategory of justice theory generally or social justice thought more specifically). As can be seen in South Africa's new national curriculum frameworks, for example, these constructs have migrated into educational discourses. One of the nine principles underpinning the National Curriculum Statement (NCS) for Further Education and Training (FET) in South Africa is: 'human rights, inclusivity, environmental and social justice' (DoE, 2003). Although formulated as one principle, four related but distinct constructs could be identified. The elaboration of this principle reads as follows:

> The National Curriculum Statement Grades 10-12 (General) seeks to promote human rights, social justice and environmental justice. All newly-developed Subject Statements are infused with the principles and practices of social and environmental justice and human rights as defined in the Constitution of the Republic of South Africa. In particular

> the National Curriculum Statement Grades 10-12 (General) is sensitive to issues of diversity such as poverty, inequality, race, gender, language, age, disability and other factors. (DoE, 2003:4)

By implication, environmental justice should therefore form part of the discursive terrains of all school subjects in South Africa. Flowing from this, we might ask how the term is understood by those with a vested interest in South African education and what the term means. The first part of the question is an empirical one and the second part a conceptual one. This complex question (the latter part in particular) has received considerable attention in environmental philosophy literature over the past two decades. Vincent (1998) is one of those who argue that environmental justice is a category error. In his view, environmental justice is a double category error because it sits awkwardly with both environmental theory (which is by and large ecocentric) and justice theory (which is anthropocentric). My interest here is not to take this discussion further, but rather to shift the angle of vision from what environmental justice *means* to what it *does* or *produces* in specific locations and the implications for education. By way of background I briefly describe the term environmental justice.

Environmental Justice

Environmental justice might in the first instance be described as a movement. As Faber and McCarthy (2003:45) write: 'It's a movement – a new wave of grassroots activism consisting of hundreds of community-based organisations working to reverse the ecological and economic burdens borne by people of colour and poor-working-class families'. Put differently, the environmental justice movement is concerned with addressing the unjust way in which environmental benefits and burdens (including problems and risks) are distributed across both global and local societies. Moreover, it also promotes broader participation (to include women and people of colour) in determining how benefits and burdens are distributed. Independent movements comprising the broader movement are:

> '1. the civil rights movement as led by African-Americans and other disenfranchised people of colour;
> 2. the occupational health and safety movement, particularly that wing devoted to protecting non-union immigrants and undocumented workers;
> 3. the indigenous land rights movement, particularly that wing devoted to the cultural survival and sovereignty of Native peoples;
> 4. the public health and safety movement, particularly that wing devoted to tackling issues of lead poisoning and toxics;
> 5. the solidarity movement for promoting human rights and the self-determination of developing world peoples; and
> 6. the social/economic justice movement involved in multi-grade grass-roots organising in oppressed communities of colour and poor working-class neighbourhoods.'
>
> (Faber & McCarthy, 2003:45-46)

But the broader movement has also reached the point where environmental justice can be viewed as a set of clearly articulated principles. Seventeen principles were formulated at the First National People of Colour Environmental Leadership Summit that was held in 1991. These wide-ranging principles include matters such as: affirming the sacredness of Mother Earth, mutual respect for all peoples, the fundamental right to self-determination, the rights of workers to a safe and healthy working environment, the enforcement of principles of informed consent, opposing military occupation, and so on (see Merchant [1994:371–372] for full description of the 17 principles). We may judge each of the 17 principles as having merit in its own right. We may also see conceptual links among certain of the principles.

But what constitutes instances of environmental injustice? In the United States the government bought out the properties of the Love Canal community in 1979 after leaking barrels of dioxin were found beneath their homes. A year later, Craver Terrace, an African-American suburb in Texarkana, Texas, was polluted by creosote (a known carcinogen) that was used by a company (Koppers) for 50 years to coat railroad ties. When the company closed their operation they simply bulldozed their facilities and covered them with soil. Plots there were sold cheaply to eager poor communities. When the community first complained about dark patches of 'gunk' seeping through their lawns and cracks in the streets, three environmental impact assessments (EPAs) were conducted: two reported that the site posed an immediate health hazard and the third said that their was no immediate danger to the community. The community was told about the findings of the third EPA but were not informed that the other two EPAs had been conducted and what there findings were. Patsy Ruth Oliver took up the Terxarkana community's case and argued that the only reason the community was treated differently from the Love Canal community was that the residents were poor and mainly African-American. She forced the government to buy out the properties of the Carver Terrace community and the toxic waste dumps were cleaned up with funds from a trust that the United States Congress established in 1980 (for detail see Shrader-Frechette, 2002).

Another instance is the following: A survey conducted in South Africa in 1994/1995 showed that respiratory illnesses resulting from air pollution were seven times higher among black children living in the former Eastern Transvaal than European children (SAIRR, 1995). The children live in informal settlements where cheap domestic fuels such as wood and coal are the main source of energy. They are therefore exposed to air pollutants as a consequence of their poor living conditions. The children also live near industrial areas and mine dumps and so are also exposed to industrial pollutants. They live close to mines and other industrial areas because their parents offer cheap labour to these industries. One of the pillars of apartheid policies was the Group Areas Act, which determined that different racial groups, black, Coloured, Indian and white, had to live in separate residential areas. The upshot of this was that poor communities (mainly African and to a lesser degree Coloured and Indian communities) were located in areas that made them vulnerable, not only because of poor living conditions, but also because of exposure to industrial pollutants.

Environmental Justice – An Order-Word

Deleuze and Guattari (1994) argue that philosophy is not about clarifying concepts, but about creating concepts. These conceptual creations they call *mots d' ordre*, 'order-words'. They write:

> We call *order-words*, not a particular category of explicit statements (for example, in the imperative), but the relation of every word or every statement to implicit presuppositions, in other words, to speech acts that are, and can only be, accomplished in the statement. Order-words do not concern commands only, but every act that is linked to statements by a 'social obligation'. Every statement displays this link, directly or indirectly. Questions, promises, are order-words. The only possible definition of language is the set of all order-words, implicit presuppositions, or speech acts current in a language at a given time. (Deleuze & Guattari, 1987:79)

I would like to suggest that environmental justice be viewed as an order-word. Gough (2004) argues that when we view concepts as order-words then the focus shifts from what a concept *means* to what it *does* or *produces* in specific locations. Environmental justice is a term that has produced a new social order and social obligations and imperatives. Globally the environmental justice movement forms part of a rhizome of new social movements that offer resistance to globalisation and the agendas of supranational organisations and multinational corporations. The environmental justice movement mobilises local communities to change their living conditions and to make governments realise their obligations to all citizens. But what is the promise of environmental justice in a post-apartheid order?

Any account of environmental justice in South Africa will inevitably make reference to the dominant environmental ideology during the apartheid era – 'characterised by a wildlife-centred, preservationist approach which appealed mainly to the affluent, educated, and largely white minority' (Khan, 2002:15). For many Black South Africans the environmental movement in South Africa was elitist and peripheral to their struggle against apartheid and for a better life. In the 1970s and 1980s the dominant environmental ideology was reflected only in ecology sections of school subjects such as biology and geography. A broader understanding of the multi-dimensional (biophysical, economic, political and social) nature of environment was not reflected in the intended curriculum for South African schools during the apartheid era. Environmental ideology during apartheid produced a conservationist order that alienated the majority of South Africans – it produced resistance to engagement with environmental-related matters.

However, the release of Nelson Mandela from prison and the unbanning of political organisations in 1990 produced a new environmental order. Khan (2002) argues that this period not only created political space to broaden horizons beyond anti-apartheid politics but also produced a more flexible and relaxed political climate that gave impetus to the dissolution of strict boundaries between politics and conservation. Organisations such as the African National Congress (ANC), the Azanian People's Organisation (AZAPO), the Pan African Congress (PAC) and the South African Communist Party (SACP) all placed environmental

issues on their agendas. In this period, environmental justice was invoked by community-based organisations (CBOs) and environmental non-governmental organisations (NGOs). Khan (2002:32) points out that the focus of these organisations was on 'brown issues' (basic needs) rather than on 'green issues'. This new environmental movement grew into a national environmental coalition, and in 1993 the Environmental Justice Networking Forum (EJNF) was formed. Khan (2002) notes that the EJNF now comprises 600 organisations. It is evident that in South Africa the concept environmental justice has produced a rhizome of organisations within the EJNF, and this forum has played a role in assisting poor urban and rural communities in addressing disparate needs, and has also been active in influencing government to take environmental justice principles on board (Khan, 2002).

Although the environmental movement grew in the early 1990s it remained a movement of the margins – it was concerned with the basic needs of the poor. However, South Africa's first democratic elections saw environmental concerns migrating into mainstream discourses, largely because those who were at the forefront of the struggle against apartheid now were in government. As a result, the right to a clean, safe and healthy environmental, for example, is enshrined in the Bill of Rights of the South African Constitution. Many other policies produced by the South African government have been derived from the Constitution. The key principles which underpin the National Curriculum Statements for General Education and Training (GET) and FET are, for example, derived from the South African Constitution. The inclusion of environmental justice into one of these key principles of the national curriculum statements should be understood in this context.

The mainstreaming of environmental concerns can produce several effects. One effect is that people suffering as a consequence of environmental injustices now have legal recourse. One demonstration of this is the action taken by the Treatment Action Campaign (a South African AIDS activist organisation) which mounted and won a legal case against the government. The judgement obliged the government to make antiretroviral drugs available to pregnant mothers in all nine provinces in order to prevent mother-to-child transmission of HIV. On the other hand, the mainstreaming of environmental concerns may have weakened grassroots environmental organisations and therefore thwarted efforts to fight against environmental injustices – since 1994 we have only witnessed few isolated cases of environmental activism in South Africa. Furthermore, the migration of environmental concerns into mainstream discourses could shift the focus of the environmental movement (and environmental education) in South Africa to one that is strongly anthropocentric, given that environmental rights and justice discourses are unrepentantly anthropocentric. A pendulum swing too far in the anthropocentric direction could be as dangerous as a narrow focus on 'green issues' only. But, what does all of this have to do with education?

Some Implications for Education in South Africa

The inclusion of environmental justice as a component of one of the key principles of South Africa's curriculum statements implies that it will form part of the discursive terrains of all learning areas and school subjects. Opportunities therefore exist for including locally relevant

examples of environmental (in)justices and bringing these to bear on learning programmes of (or across) different school subjects. If harnessed in meaningful ways, these opportunities could have transformative effects for teaching and learning in all school subjects.

The strong emphasis on environmental justice, human rights and inclusivity is understandable given South Africa's apartheid history. However, the inclusion of environmental justice as an underlying principle of South Africa's national curriculum statements also frames environmental education in a particular way; there certainly is an anthropocentric turn or return evident here. In South African education policies environmental justice is an order-word, commanding teachers and learners to obey an anthropocentric directive. As mentioned, narrow ecocentric or anthropocentric perspectives are not helpful in addressing complex environmental problems/issues. So is there an escape from a new anthropocentric order? Deleuze and Guattari (1987) argue that beneath order-words there are pass-words. Concerning the latter, Gatens (1997: 182) writes:

> Pass-words 'transform the composition of order into components of passage'. The pass-word is a 'line of flight' that transforms the plane of organisation by acting creatively rather than reacting to the command embedded in language. Creation displaces the command function of language, it expresses a new action, it calls upon the 'commander' to react or flee because it shows his world as one possible world rather than *the* world.

In this context, Honan (2004) argues that teachers do not simply obey policy commands; they analyse policies rhizomatically. She argues that rhizo-textual analysis of the relations between teachers and texts disrupts a commonplace understanding about these relationships that currently inform much of the work done by policy-makers and policy analysts. Teachers engage rhizomatically with policy texts such as national curriculum statements: some acquiesce, some resist, some subvert, and so on. Creative teachers might think of indigenous knowledge (also one of the principles of South Africa's curriculum statements) as a pass-word and invoke indigenous stories in pedagogical episodes that could expand the notion of justice to the realm of non-human nature, and by doing so disrupt/transform the anthropocentrism of commonly held views on environmental justice.

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Viewpoint
Reading Conference Recommendations in a Wider Context of Social Change

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Abstract

This short Viewpoint paper considers the role and value of conference recommendations in shaping the field of environmental education. It explores the social politics, and often contested nature, of conference recommendations and their institutional histories, arguing that the act of producing conference recommendations forms part of the practices of new social movements. The paper recommends historicising conference recommendations and Œcross readings, to consider changing discourses and new developments in the field. Accompanying the short Viewpoint paper, are two sets of recently produced conference recommendations, one from the 4th International Environmental Education Conference held in Ahmedabad, India, and the other from the 1st International Conference on Mainstreaming Environment and Sustainability in African Universities held in Nairobi, Kenya.

Introduction

This Viewpiont paper was inspired by a request to publish the 4th International Conference on Environmental Education declaration and recommendations produced at the end of 2007 in Ahmedabad, India, in this edition of the Southern African Journal of Environmental Education (SAJEE), and was produced shortly after the 1st International Conference on Mainstreaming Environment and Sustainability in African Universities (MESA). The paper provides a 'foil' for the publication of the Ahmedabad declaration and conference recommendations (this edition), and the MESA conference recommendations (this edition) and encourages readers to think more deeply about conference recommendations. It considers why we might invest valuable time, energy and effort into the processes of generating, sharing and using conference recommendations. In the field of environmental education there have been various more or less popular sets of conference recommendations, each with its own institutional and social history. I first briefly review these, and then discuss the phenomenon of conference recommendations in relation to social movement theory in a little more detail, although the reflection is short. The purpose of this reflection piece is to consider the wider picture of environmental education conferences, and how their products contribute to new social movement intentions and politics.

The Emergence of Different Sets of Conference Recommendations

Some of the earlier and most memorable international environmental education conference recommendations are the 1977 Tbilisi Principles (UNESCO-UNEP, 1978). They were developed at the 1st International Conference on Environmental Education held in Tbilisi a few years after the 1st International Conference on the Human Environment held in Stockholm in 1972. These principles 'filled a niche' that was previously vacant, since many governments and social and educational practitioners around the world have (and to this day still) use these principles to inform decision-making, practices, courses, materials and guidelines for environmental education. These have, however, not been without critique, and early on Robottom (1987) critiqued the Tbilisi principles for their institutional culture and their 'bland' rhetoric devoid of strong value orientations or positioning in relation to social justice. An almost silent 'second set' of recommendations emerged a few years later at the 2nd International Conference on Environmental Education in Moscow in 1987. These were mostly oriented towards UNESCO and UNEP's own practice at the time, and thus seemed to have minimal wider impact.

A more memorable set of conference recommendations (at least from a southern African environmental education perspective) were the NGO Forum Principles that were put out by the International Centre for Adult Education shortly after the Rio Earth Summitt in 1992 (ICAE, 1993). These recommendations were not produced by UNESCO or UNEP or any other UN organisation, but by a civil society movement participating 'outside' of the mainstream UN conference. This set of civil society recommendations has had a profound material and social effect on environmental education in southern Africa, as it has guided a democratic turn in which we were willing to engage critically and practically with the recommendation that 'we are all learners and educators' and with recommendations for inclusivity, participation and the valuing of indigenous knowledge, amongst others.

At the same event (the Rio Earth Summit in 1992) Chapter 36 of Agenda 21 (UNCED, 1992) was produced, which gave UNESCO the mandate to integrate environment and development education into a new synthesis under the banner of education for sustainable development (ESD). This move has been highly contested, particularly by environmental educators who have argued that this international framework limits and narrows the focus of education (Jickling, 1999); confines concepts of environment and allows for appropriation by the prevailing political economy of globalisation and exploitation (Sauve, 2005); and allows for economic appropriations of wider environmental education discourses (Gaudiano, 2007; Lotz-Sisitka, 2004), which has negative impacts on the poor and already marginalised. This contestation was reflected in ambivalent and antagonistic engagements with the conference recommendations produced at the 3rd International Conference on Environmental Education in Thessaloniki in 1997 (UNESCO, 1997), which many critiqued for being predetermined and for not allowing adequate debate and discussion on their origination and construction. By this time there seemed to be a greater awareness of the possible material and political role that conference recommendations have when approved by bodies such as the UN. The Thessaloniki conference outcomes were contested for their focus on ESD, providing a further indication

that the emergence of ESD discourse was not without contestation. Sauve (2002), for example, argues that in the conceptual framework of sustainable development (illustrated by the 'balance' between economy, environment and society) economy has already been elevated as a separate autonomous entity, outside the social sphere, which determines a society's relationship with the environment. She questions whether this should be promoted as the supreme goal of humanity through education.

The World Summit on Sustainable Development in 2002 proposed the UN Decade of Education for Sustainable Development (UNDESD) which was ratified by the UN General Assembly to start in 2005 (UNESCO, 2005). Various UN, international and national government-led initiatives have been established to integrate ESD into national policies, actions and universities. Within these is a wide-ranging diversity of orientation, intention and practice, with seemingly inadequate financial backing to implement a very ambitious agenda for educational transformation. At the same time, the NGO movement involving environmental education associations around the world gathered and proposed the establishment of a World Environmental Education Congress, the first of which was held in Espino, Portugal, in 2003, the second in Rio de Janeiro in Brazil, 2004, the third in Turino, Italy, in 2005 and the fourth (hosted by EEASA) in Durban, South Africa, in 2007. In 2009 this conference will move to Montreal, Canada, effectively cementing a firm commitment from environmental educators around the globe to strengthen their international links and voice as a significant force in the UNDESD and beyond. Within this movement lies a somewhat ambivalent engagement with ESD discourse, which is slowly becoming amplified and/or superceded by recent attention to climate change. This brings renewed attention to the links between environment and sustainability in education. New concepts to guide practice are emerging beyond the dominance of sustainability, a recent example being socio-ecological resilience (Folke, 2006).

An interesting 'crosshatching' of engagement between environmental education and education for sustainable development is visible in the social politics of conference recommendations in the 2007-2009 period. The Indian government, with support from UNESCO and UNEP, hosted the 4th International Conference on Environmental Education in Ahmedabad, India, at the end of 2007. A declaration and a set of recommendations were developed at this conference which resonate with the sentiments of the International Council for Adult Education (IACE) recommendations produced in Rio in 1992. They call for a 'radically different new Enlightenment' than that currently guiding humanity, and for a radical shift in global politics, models guiding development (i.e. a model of sufficiency rather than efficiency) and approaches to education. They affirm the breadth and scope of contemporary environmental education as encompassing community education, inclusion of the marginalised and more formal institutional settings for education; and they argue for education's contribution to meaningful socio-ecological transformation. These recommendations were compiled during the conference from the inputs emerging from 40 different workshops, and were reviewed and ratified by the full conference delegation before the end of the conference following a participatory process. They therefore represent the 'spirit of the moment', constructed in the company of 1 500 people mainly from what is currently called the 'global South', but not excluding a number of wider international representations at the conference. These

recommendations consider the importance of strengthening environmental education within the wider UNDESD initiative and extend (and in many ways provide) an epistemological challenge to the contents of the International Implementation Scheme produced to guide the UNDESD by UNESCO (UNESCO, 2005).

In 2009 UNESCO will host the first World Conference on Education for Sustainable Development in Bonn, with its set of recommendations which could be ratified by the UN General Assembly (i.e. all of our governments) in a similar way that the UNDESD was ratified. Will these recommendations be used by governments, and by whom and how will they be constructed? Shortly afterwards the 2009 World Environmental Education Conference will be held in Montreal, Canada. Will this conference produce more recommendations? Who will use them and how will they be constructed? How will they contribute to a diverse and shifting cultural capital circulating in our field? And will they have social transformation possibilities?

Social Politics and the Role of New Social Movements

As indicated above, the social politics of conference recommendations can be an interesting topic for deliberation when considered in the context of time-space configurations, the mapping of institutional affiliations and resistances. This can provide insight into the nuances of a social movement at work. According to Melucci (1996) new social movements are 'disenchanted prophets' who are a sign, not an outcome of a crisis. 'They signal a deep transformation in the logic and the processes that guide complex societies'(Melucci, 1996:2). The environmental movement, with its environmental education arm, is such a movement, busy with the project of 'speaking before', seeking diverse ways of inserting new categories into society (in our case it would be inserting thinking about environment, sustainability, equity and socio-ecological resilience, amongst others, into the education system), and they reflect the commencement of change. Melucci, however, warns that these movements must also proceed within a disenchanted framework, and should at the same time be both involved and detached, passionate and critical, and reflexive of their own role and moves in society. Such movements are not 'uniform' and involve diverse phenomenon, and generate ambiguities (as seen in some versions of environmental education and ESD, and in the 'currents of environmental education' identified by Sauve, 2005), if not outright contradictions (Melucci, 1996:3). Such processes also involve power relations and ideological contradictions. Bringing about social change is not a smooth process, as can be seen from the diversity and contestation surrounding environmental education conference recommendations and their reception to date.

These processes might be worth reflecting on in a little more depth given the rise in global conferences on environmental education and education for sustainable development, and what seems to be an increase in global 'products' emerging in the form of declarations, recommendations and proceedings which have the intention of guiding governments and practitioners in their environmental education practices.

Social movement theorists such as Melucci (1996) and Tourraine (2000) offer insights into what might be going on in the field of environmental education as we 'conference together' and produce more and more steering ideas (in the form of conference recommendations) for

each other and an ever-widening group of practitioners who are contributing to the expansion of environmental education (and ESD) in different contexts. Delanty (1999) argues that at the start of the 21st century we have moved beyond discourses of postmodernism, which rely on conceptions of the individualised subject, or the modernism of Habermas, which operates with a somewhat decontextualised conception of agency. Touraine and Melucci present us with a social actor that is not decontextualised, but one who is a collective actor and an agent of social change (Delanty, 1999). Like Melucci, Touraine argues that society has a capacity to reflect upon itself and to interpret the direction of its movement. Might our regular production of conference recommendations and our intellectual engagements with them (i.e. the Robottom, Sauve, Jickling, Gaudiano, Lotz-Sisitka) and other comments referred to above be indicative of part of a field-based reflexivity which is deliberatively engaging the direction of its movement at a global level? Delanty (1999:125) explains:

> The cultural model captures the creativity of social action and gives it a cognitive form, which allows social actors to interpret the social field. This capacity is the cultural model, and is the basis of all change; it is the 'image of creativity' and gives society a set of orientations that govern social action.

As indicated in the discussion above, the contestations that have been going on in relation to environmental education (institutional and civic versions) and later between environmental education and ESD (institutional and civic versions) captures the 'creativity of social action'. The conference recommendations produced as artefacts along the way appear to be providing the field with useful collective cultural capital (produced at various intervals by different groups embroiled in diverse politics and contexts) that provide for orientations to direct our thinking and deliberations in ways that help us to either govern our social actions (in this case, our educational thinking and practice) or to engage in contested arguments for creating better governance frameworks that allow for open-ended governance. As indicated above, these recommendations are more or less powerful and appear to resonate differently in different contexts, and as Robottom said as early as 1987 all of these documents are imbued with particular ideological perspectives and theories of social change, which when institutionalised can become technocratic.

Historicity (and being able to view our various conferences and their products from this vantage point) conceives society as a 'set of cultural tensions and social conflicts' (Delanty, 1999:126) rather than as interaction and participation of actors (i.e. conference goers). In this process knowledge as an agent of social change and the capital it embodies can enable society to act upon itself and to bring about social change. The basis of Touraine's social theory is that there is one central conflict in every society (e.g. the conflict between environment and economy), but there is not necessarily only one social agent. As we have seen from the description of the conferences and their recommendations above, the social agents involved in the hosting and production of the conference outputs are many and varied in nature and cover the full spectrum of international organisations, national governments and civil society groups, and a wide range of vantage points and ideological perspectives. Sauvé (2005) recently

summarised these as representing a variety of what she called 'currents': naturalist, conservation/resourcist, problem solving, systemic, scientific, humanist/mesological, value-centred, holistic, bioregionalist, praxic, socially critical, feminist, ethnographic, eco-education, and sustainable development/sustainability oriented. She concludes her analysis by stating that: 'The effort to identify and characterise currents in environmental education leads to the construction of a typology of the various ways of conceptualising and practicing environmental education. Clearly, further analysis remains to be pursued in an ongoing mapping of this field' (Sauvé, 2005:31). Her argument is that this mapping process can be stimulating of reflexivity, change and further creativity in an already rapidly changing field.

Both Melucci (1996) and Touraine (1977) argue that social movements are instrumental in bringing about social change; they translate the cultural model and the field of historicity into a system of social and political organisation with various material outcomes. For example, UNESCO (2004) reported that environmental education, along with technology education, is the fastest growing curriculum change area in formal education systems around the world, indicating that the mobilisation of the cultural model (using international conferences and conference recommendations as one instrument) has the potential to bring about social change. In South Africa (Lotz-Sisitka, 2002) and in Botswana (Ketlhoeilwe, 2007) we have seen direct evidence of how social movements are able to translate the cultural model (represented in the Tbilisi Principles, the NGO Forum Principles or the UN International Implementation Scheme) into social and educational change processes.

Historicising Conference Recommendations

This short Viewpoint paper on conference recommendations provides some food for thought on why we continue to engage in this practice, and may open the space for a more in-depth deliberation or more careful empirical investigations into why the process of producing international conference recommendations (by civil and institutional groups as well as cross-overs and hybrids of civil and institutional groups, and in various ways on various continents) seems to be proliferating. Perhaps we require more variety, greater plurality and more cultural capital at this point in history to reflect on an increasingly complex set of socio-ecological issues and educational contexts and settings in which we respond to these. The 19th-century modernist project seeking to unite society under one frame is apparently no longer possible, although it would seem that we may need to unite our pluralist views on one finite planet (as climate change is showing). As Delanty (1999:127) argues, '… society is not a whole, or reducible to a single category, but is diffuse'. Political monitoring of the World Social Forum demonstrates the horizontal proliferation of new social movement groups, cultural capital and strategies for bringing about social change (Wallerstein, pers. comm., July 2007). According to Touraine, society is not merely a system of norms or a system of domination: 'it is a system of social relations, of debates and conflicts, of political initiatives and claims, of ideologies and alienation' (Delanty, 1999:128).

Social change is a complex process, and involves questions of transition, crisis and transformation, and many kinds of collective action (Delanty, 1999). Producing conference

recommendations appears to be an interesting part of this process. Wallerstein (2006:83) argues not for radical relativism in embracing pluralism, but rather for historcising our engagements in a field; which means we need to place the reality we are immediately studying or experiencing (a conference and its outcomes) '… within the larger context: the historical structure within which it fits and operates'. He explains further that: 'We can never understand the detail if we do not understand the pertinent whole, since we can never otherwise appreciate exactly what is changing, how it is changing and why it is changing … one cannot historicise in a void, as though everything were not part of some large systemic whole. All systems are historic, and all history is systematic' (Wallerstein, 2006:83). We are, as Wallerstein indicates, in the unit of analysis we can call the modern world-system, but we are also within a particular moment of that historical system, 'its structural crisis or age of transition' (Wallerstein, 2006). This view may help us to understand the proliferation of environmental education conference outcomes with more depth and perspective.

Conclusion

In concluding this short Viewpoint paper, I would like to recommend a re-reading of the Tbilisi Principles, produced in 1997, in relation to the 2007 Ahmedabad declaration and recommendations. It may then be interesting to read these in relation to the MESA conference recommendations, with due consideration for how, where, when and why they were produced. Similar relational and critical readings can be made of the UNDESD International Implementation Scheme (UNESCO, 2005) accessible on http://www.unesco.org/education/desd) and its production and consumption. Also look out for the conference recommendations that will emerge from UNESCO's 2009 World Conference on Education for Sustainable Development in Bonn, and, of course, the Montreal 5th World Environmental Education Congress discussions/recommendations. The purpose of all of this effort would be to consider the significance of this cultural capital in relation to own and other practices and contexts, and to the social change possibilities that might exist through this work at local, national and/or global levels.

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Conference Recommendations

Moving Forward From Ahmedabad … Environmental Education in the 21st Century: 4th International Conference on Environmental Education, Ahmedabad, India, 26-28 November 2007

UNESCO, UNEP and Government of India

From Tbilisi to Ahmedabad

International conferences mark changes in thinking and approaches. They also set new agendas for action. The first set of international recommendations to guide environmental education were developed in Tbilisi, Georgia, in 1977. Ten years later, in 1987, a conference in Moscow reviewed progress and focused on institutional strategies and action plans to strengthen environmental education. A third international environmental education conference was held in Thessaloniki, Greece, in 1997, which debated the role of environmental education in contributing to sustainable development. Following the World Summit on Sustainable Development in 2002, a United Nations Decade on Education for Sustainable Development (UNDESD) (2005-2014) was launched, based on earlier recommendations in Chapter 36 of *Agenda 21*. The 4th International Conference on Environmental Education, held in Ahmedabad, India in 2007 within the framework of the UNDESD, marks 30 years after Tbilisi.

This document reflects views and perspectives of over 1 500 people from 97 countries attending the Ahmedabad Conference. It concentrates on common themes raised in the conference, and is complemented by a conference declaration and recommendations on more than 30 topics discussed by working groups at the conference.

In drafting this set of recommendations, we recognise this document as one in a range of documents that provide orientation to environmental education in the 21st century, most importantly the DESD's *International Implementation Scheme* and associated regional, sub-regional, national and local strategies and action plans being developed to guide implementation of the UNDESD.

How Environmental Education evolved from 1977 to 2007

In 1977 the Tbilisi Declaration made far reaching recommendations that environmental education should be lifelong, integrated, active and inclusive. This meeting also recognised the complex and multi-dimensional nature of environmental issues, and the need to investigate the root causes of environmental problems.

Since 1977 international thinking about environmental education has changed, mainly through a broadening of participation in the field, as well as rapid changes in society, the economy and

the global world order. These recommendations build on the strong foundations that environmental education has provided in the evolution of education for sustainable development (ESD) and re-affirm the need to further strengthen environmental education.

A broad review of the evolution of environmental education shows the multi-dimensional nature of these changes:

- *Changes in thinking about education and learning:* In 1987 the emphasis was on education and training, while discussions in 1997 introduced collaborative learning. Today the emphasis is on experimentation and broader social and cultural situated learning processes that take account of context. These changes in thinking about education and learning have been accompanied by changes in pedagogy and methods. However, there are still great challenges to make these approaches to learning work in formal educational settings that are slow to change.
- *Changes in leadership and partnerships:* In 1977, leadership for environmental education was provided mainly by two UN agencies: UNESCO and UNEP. Since then, many international and national NGOs and universities have joined in the process of providing leadership, indicating a growth in institutional contexts for environmental education. Today national governments and national and international organisations are also providing leadership for ESD through various partnerships.
- *Changes in conceptualising the environment–development relationship:* In 1987 the focus was on environment in the context of social and economic issues, while the 1997 conference recommendations noted that poverty reduction was necessary to achieve sustainability. Today, environmental educators are considering the inter-relationships between environment, society, culture and economics, although many are concerned that economics dominates the others. This raises issues of equity and social justice. The concerns and issues of risk and disaster management and mitigation have also gained recognition in environmental education thinking as we begin to experience global climate change impacts.
- *Changes in communications and access to knowledge:* The last two decades have seen rapid changes in the knowledge, communications and access to information environment. In 1987, communication was mainly through newsletters, in 1997 worldwide internet communication was just emerging. Today there are a wide range of communication possibilities, and the internet has fundamentally changed the knowledge environment. However, access to communication technology remains unequal, and education is not accessible and available to all.
- *Changes in emphasis on issues:* Over the past 30 years the emphasis on environmental issues has changed – from pollution and population growth in 1987 to poverty and sustainable development in 1997 to global climate change, which tops the international political agenda today. There is a recognition that environmental issues such as global climate change are interconnected with a range of related issues such as health, human rights, the right to education, poverty, pollution, business responsibility, consumption and production, biodiversity loss, water quality and quantity, energy, gender, and environmental ethics, amongst others. Environmental justice and social justice have

become closely linked. Although the widening scope of issues may make the education process seem more complex, it also requires more holistic, comprehensive discussions and policy synergy.

- *Changes in sites of learning and participation in learning:* There has also been a broadening of learning sites, media and methodologies. In 1987, environmental education was mainly practised in a narrow range of institutional contexts such as schools and environmental organisations, while in 1997 it had widened to include people in business, local government, community development and other areas. Today environmental education and ESD is practised in the health and disaster relief sectors as well as a wide range of other social and institutional contexts. The widening of learning sites is accompanied by new media and methodologies that allow for border crossings and multi-site learning, and a broadening of participation in the learning process.

Within this changing framework, many thousands of environmental education programmes, projects and materials have been developed and used with millions of learners, community members and decision-makers in all countries and learning contexts around the world. Networks and partnerships have been formed, official policies have been developed, and professional courses and qualifications exist. Institutions have grown and a new professional field has emerged. Many smaller meetings and conferences have been held, involving both government and civil society organisations. These programmes and projects have been driven by extremely committed people and groups who share a common ethical commitment to a better world for all people and all life forms. They have concern for the future, for the world, and for equity, democracy, sustainability and justice.

Despite these efforts, the state of the planet has gone from bad to worse. To this, we have added the crisis of climate change which scientists have confirmed is real and requires urgent action.

Thus, we draw attention to a new sense of urgency and the need for a new, broader approach to environmental education in a very different social, economic and political climate, and knowledge environment to that of 1977 when the Tbilisi Declaration was formulated.

A New Sense of Urgency and a Need for a New Paradigm

Our recommendations for environmental education and education for sustainable development from 2007 must be rooted in the harsh reality that not only are we exhausting and plundering the resources of the Earth at unsustainable rates, but we are on the threshold of unimaginable devastation that climate change is likely to bring.

We no longer need recommendations for incremental change; we need recommendations that help alter our economic and production systems, and ways of living radically. We need an educational framework that not only follows such radical changes, but can take the lead. This requires a paradigm shift. The roots of our present education paradigm the world over can be traced to the Enlightenment era, which gave birth to science as we know it today and influenced all areas of human thought, activity and institutions. This Enlightenment paradigm is

based on the ideas that progress is rooted in science and reason, and that science and reason can unravel the mysteries of nature. It encourages us to 'know' nature in order to use, transform and consume it for our insatiable needs.

Today, we need a new Enlightenment to redefine our notion of progress. Since we have rapidly exhausted or polluted nature in pursuit of such progress, this new paradigm needs to recognise that we must live within the limits of nature's systems and that that we need to 'know' nature in order to transform societies to live sustainably in happiness, peace and with dignity amongst themselves, and in relation to planet Earth.

Such a new Enlightenment not only requires the specific changes that the following recommendations suggest, but demands fundamental changes in the creation, transmission and application of knowledge in all spheres and at all levels.

To implement these recommendations, we need to work for immediate change even as we acknowledge the current state of the planet, the contemporary paradigm under which society and the education system functions, and the need for a fundamental change in the purpose and practices of education.

Environmental Education in the 21st Century: Making It Happen

These recommendations reflect the essence of the hundreds of recommendations made at the conference. They call upon education, environmental and sustainable development practitioners and institutions, including international organisations and national governments, to work individually and collectively to transform the words into actions.

The 4th International Environmental Education Conference:

1. Reaffirms the recommendations made by the 3rd International Environmental Education Conference and the United Nations' *International Implementation Scheme* for the Decade of Education for Sustainable Development that education must be recognised as an effective driver of change in conjunction with other drivers, such as ethical actions, government policies and regulations, economic incentives and technology.
2. Applauds governments that have instituted policies and frameworks for environmental education and ESD, and urges all countries to give greater priority to funding and supporting the implementation these policies and frameworks. We urge citizens to hold governments accountable for this implementation.
3. Supports the work of communities, groups and institutions that are working towards a secure and sustainable world, and urge these groups to build on and extend their work within a broad partnership framework.
4. Realises that we need to search continuously for new paradigms and innovations as we do not have all the answers for creating sustainable futures. We must stimulate learners in all sectors of society to envision and create new development paths, networks and social practices to achieve sustainability.

5. Urges everyone to learn from history, nature and natural systems to develop understandings of how to respect and live within the limits of nature, and to evolve social, production, technological and economic systems that are creative, innovative, equitable and sustainable.
6. Promotes education that builds capacity to engage critically with contemporary (unsustainable) development discourses and practices and that nurtures and strengthens dialogue and advocacy skills.
7. Endorses education for the achievement of equitable and sustainable livelihoods for all people. Such education develops the knowledge, skills and talents necessary for participating with dignity in a range of sustainable livelihood strategies (including employment, self-employment, entrepreneurship and other forms of work). Innovative livelihood strategies, not based on exploitation of nature or other people, need to be developed in all societies around the globe.
8. Endorses Gandhi's words that 'there is enough in the world for everyone's need, but not for anyone's greed' and recognises that there are people who are still unable to meet their basic needs, people living within their needs, and systems that are turning greed into need. Environmental education must recognise and critically engage the tension between needs and greed.
9. Encourages the use of monitoring and evaluation practices that are designed to be a valuable learning process for all involved. A learning-oriented view of monitoring and evaluation can build capacity as well as identify best practices.
10. Supports the concept of a Planetary Fund for Environmental Education for building sustainable societies through the development of policies, programmes and initiatives that are equitable, and that are supported and sustained over the long term.

The Conference further recommends changes in several areas of thinking and practice:

1. *Change thinking about education and learning*
   - 1.1 Promote earth system literacy and systemic thinking skills in environmental education to understand the nature of interdependency within the human family, the biotic community and the planet's life-sustaining processes that explain the causes and solutions for the critical challenges we face.
   - 1.2 Orient education towards preparing people to mitigate, live with and adapt to a new risk environment given the way that climate and ecosystem functions are changing.
   - 1.3 Redirect education, which is a social process, towards bringing change in lifestyles (in consonance with sustainable consumption and production), building social cohesion and respect for cultural diversity, directing organisational practices towards sustainability and towards including all people in all walks of life at all stages of the lifelong learning process.
   - 1.4 Take an integrated approach to environmental education so that it can be a process of transformation. Teaching and learning should make use of diverse methodologies and be sufficiently flexible to cater to the various needs of learners in different

cultures, contexts and nations. Such teaching and learning should incorporate ethical and critical reflection and creative thinking and learning approaches (such as those that characterise arts, design and creative cultural fields) and be inclusive of various approaches to learning. Educators and learners should explore and draw on local environments and knowledge critically and creatively to inform their work.

1.5 Use education to enhance dialogue among educators, community members and leaders, and empower and encourage people to actively participate in civil society. Develop capacity to engage with wider power relations and the effects of power in society.

1.6 Employ pedagogies in schools and other formal learning institutions as a means of integrating environmental education and ESD principles and transformative learning approaches across all areas of the curriculum and all aspects of the school/formal learning institution's life. Provide and develop clear direction for formal education curriculum development to enhance progression in environmental learning over time.

1.7 Use non-formal education practices to enhance ties and strengthen the relationship between formal education and the local community.

1.8 Help people to review values in relation to policy and behaviour through mandatory interdisciplinary and/or trans-disciplinary courses of learning for sustainability that employ new research and pedagogical approaches. Such courses can be developed (for formal and non-formal learning contexts), shared and reviewed within a learning network approach.

1.9 Design monitoring and evaluation of environmental education and sustainability practices in such a way that these processes can become a valuable learning process for all involved. A learning-oriented view of monitoring and evaluation has the potential to build capacity for critically reflective practices and educational and social change.

2. *Change patterns of leadership and partnership formation*

2.1 Base partnerships on a common vision and principles of equity, the ultimate goal of which is the benefit of communities, the public good and the sustainability of life.

2.2 Bridge gaps between different groups, ministries, sectors (particularly public-private), student leadership and youth movements, as well as other stakeholders through new partnerships that develop understandings and actions to achieve sustainable practices.

2.3 Encourage new initiatives and organisations where needed, and work towards building synergies through, for example, the use of active coalitions.

2.4 Generate educational practices and research that lead to solutions for cross-border environmental problems and stronger environmental education and ESD practices at local, national and global levels through inter-country and regional exchanges and cooperative support within a partnership framework.

2.5 Develop capacity for leadership based on accountability, and the modelling and demonstration of new practices.

2.6 Support the media and other communication and educational organisations to embrace sustainability practices and to lead by example.
2.7 Implement and develop strategies that enable decision-makers to make informed and accountable evidence-based decisions in the interest of the public good and the sustainability of life.
2.8 Encourage interested countries from different regions to work in collaboration with UNESCO, UNEP and other UN organisations to continue providing the leadership necessary to exchange knowledge and experience and identify practical ways of working together, including the development of national policy frameworks, pilot programmes and demonstration projects for wider benefit.

3. Change how we understand environmental issues

3.1 Base environmental education on an understanding of the inter-related dynamics of environment, society, culture and economics, and an understanding of the nature and causes of risks and issues that impact on socio-ecological relations, systems and structures at local, national and global levels.
3.2 Recognise the multi-faceted nature of environmental issues, and mainstream them across all disciplines and sectors as a priority.
3.3 Use education to develop capacity for democratic participation in Earth governance through building understandings of the relationship between ethical principles (such as those outlined in the Earth Charter), legal instruments, multilateral agreements and national policy frameworks in all areas related to sustainable development.
3.4 Integrate education processes as a substantive part of environmental management and sustainable development plans and strategies in all sectors and organisations concerned with environmental change and sustainable development.
3.5 Document success stories, new practices from communities and educational organisations as well as stories about conservation, innovation and transformation that can be part of a knowledge commons for wider adaptation and/or replication to broaden knowledge of environmental issues and risks and how to respond to them.

4. Change how we conceptualise and engage with the environment–development relationship

4.1 Orient thinking and educational practices that deal with the environment towards concepts and practices of *sufficiency* and *sensibility*, in addition to the current focus on *efficiency*.
4.2 Integrate a philosophy of care (for oneself, one another, future generations and the larger living world), peace, truth, justice, tolerance and kindness amongst people, nations and generations in ways that are informed by values such as those presented in the Earth Charter into environmental education and ESD actions and practices. Also, acknowledge the need for critical ethical reflection in education.
4.3 Treat environment as intrinsic to development decisions, and not as an externality. Educators should engage with decision-makers and other stakeholders to include full

environmental and social cost accounting in development decisions so all can learn how to avoid past developmental mistakes.

4.4 Use environmental education to build capacity to engage critically with contemporary (unsustainable) development discourses and practices, particularly amongst the poor, marginalised and vulnerable, and amongst development thinkers and planners.

4.5 Build capacity for achieving equitable and sustainable livelihoods, and the knowledge, skills and talents necessary for participation in a range of livelihood strategies (including work, self employment, entrepreneurship and new forms of work). New, more sustainable livelihood strategies are required in all parts of the world, amongst rich and poor.

4.6 Mainstream environment into the development agenda, on an *equal par* with social and economic concerns, and provide adequate resources for the education and learning processes needed for this mainstreaming.

4.7 Bridge the gap between environment and development through effective use of information and research findings, collaborative planning processes (e.g. scenario planning strategies), and systemic and critical thinking.

5. *Change how knowledge is viewed, and our communication practices*

5.1 Adapt and use systemic, critical and creative thinking and holistic approaches to knowledge that are grounded in sustainability practices to facilitate ESD in schools, communities and societies.

5.2 Value traditional wisdom and indigenous knowledge for their potential contribution to re-thinking practices and opportunities for sustainability. Accept a multiplicity of knowledge systems as legitimate in the educational process since many of the solutions may be inherent in knowledge systems practiced in indigenous and traditional systems, now and historically.

5.3 Strengthen and extend educational processes based on exploration, negotiation, deliberation and dealing with risks and challenges, as these are the basis of a critical mass of 'people's and community' knowledge and coping systems.

5.4 Value conflict, dissonance and diverse points of view in the learning process as a legitimate basis for knowledge creation and learning. Use active networks to link up and juxtapose a plurality of sources and points of view.

5.5 Provide citizens and learners with a dynamic space to share visions, educational practices and resources through applications of information and communication technology (ICT) and other communication mechanisms, systems of portals and other decentralised communication strategies (e.g. radio). Through this, facilitate joint monitoring and evaluation of the status of the Earth, the status of human and non-human governance processes and provide a self-validating and democratic knowledge commons. Make efforts to link up the knowledge of communities not digitally connected to ensure inclusivity in the creation of such a knowledge commons.

5.6 Nurture and strengthen advocacy (including dialogue) skills to enable better negotiation at all levels (local, regional, national, global) and critical and positive approaches to change. Identify and develop opportunities for developing advocacy skills for change towards sustainability goals.

6. *Change sites of learning and participation patterns and practices*
   6.1 Review and change existing educational structures, roles and forms to allow for effective environmental education and ESD practices.
   6.2 Create and strengthen new opportunities for participation in sustainability practices through integrated communication between various stakeholders including the educators, media, communities, men and women, and youth groups, etc.
   6.3 Create and extend educational efforts to mobilise diverse groups to participate in planning at different levels to regain control over resources to meet livelihood needs and ensure sustainability of ecological systems.
   6.4 Strengthen and extend learning capability through participation in communities of practice and networks oriented to existing and new sustainability practices.
   6.5 Carefully design and agree upon the components of assessment and evaluation as these are interconnected. All stakeholders should be part of this process so that criteria and processes are transparent, inclusive and change oriented.
   6.6 Integrate emancipatory, participatory and other transformative research approaches into international, national and institutional research agendas.
   6.7 Emphasise and value the role of teacher education as a catalyst for orienting educators to sustainability practices and real world concerns.
   6.8 Draw on the surrounding socio-ecological and cultural environment as a setting for learning and support learning in these settings with appropriate mediation practices.
   6.9 Contribute directly to hands-on action and change through environmental education and ESD practice.

These recommendations were adopted by the delegates of the 4th International Conference on Environmental Education on the 28th of November 2007 at the Centre for Environment Education, Ahmedabad, India

Conference Recommendations

Mainstreaming Environment and Sustainability in African Universities Partnership: Participants' statement on the 1st International Conference, Nairobi, Kenya, 24-28 November 2008

UNEP

Introduction

The United Nations Environment Programme (UNEP)-led Mainstreaming Environment and Sustainability in African Universities (MESA) Universities Partnership, involving key partners such as the African Association of Universities, UNESCO, SADC and the Horn of Africa Regional Environmental Centre and Network (amongst others), held the first biennial international MESA conference from 24 to 28 November 2008 in Nairobi, Kenya. The objectives were to consider how universities were responding to environment, development and climate-change challenges, to enhance policy relevance of African university programmes, contribute to the revitalisation of African universities, and provide a platform for collaboration on change responses and North–South, South–South and South–East dialogue on education for sustainable development (ESD) best practice. The conference also sought to promote expansion and dialogue between Africa's 11 regional centres of expertise in ESD, and wider sub-regional and regional networking and knowledge exchange. It also focused on contextualising Africa's local and wise knowledge as a way of responding to new challenges. Innovations in the MESA Universities Partnership were highlighted and recognised at this conference, which was attended by over 200 participants from 40 countries.

This statement is a record of recommendations by the MESA Universities Partnership Conference participants. It is informed by the main issues that emerged out of the five-day conference deliberations and is produced as background documentation for the African Association of Universities Conference on 'Sustainable Development in Africa: The role of Higher Education' (2009), the World Conference on Higher Education (2009) and the World Environmental Education Congress (2009). The recommendations are discussed under five clustered themes, namely: knowledge, innovation and development; teaching and research; partnerships and networking; educational and institutional leadership in ESD and policy issues; and promoting and enabling student participation. Recommendations are made to inform the MESA Universities Partnership, as well as university leaders, students and the wider higher education sector.

Knowledge, Innovation and Development

- African universities should develop an African research agenda on environment and development challenges (including climate change adaptation and mitigation) that can develop, draw on and mobilise African indigenous knowledge and other knowledge systems.
- African universities should adopt a critical and constructive approach to teaching and research that aims to produce a critical mass of students who are keen to examine how values, ethics and existing power structures affect the environment, development, society and their futures.
- Higher education institutions need to help redefine development within an African context, making it historically and culturally specific with recognition of Africa's relationships within a wider global context.
- Positive action-, solution- and capability-centred approaches to ESD need to be strengthened in formal and non-education systems across the African continent.
- African universities should contribute to the establishment of multi-and/or trans-disciplinary research and learning centres for ESD that can serve as 'innovation hubs' that can help to provide multi-disciplinary teaching and research to address critical issues such as climate change, loss of ecosystem services, as well as unsustainable development models and choices. Such centres should also address non-formal learning needs in society such as building negotiation capacity and community resilience.

Teaching and Research

- African research, policies and practices need to focus on resilience with its three main features: persistence, adaptability and transformability.
- Universities in Africa should promote other means and modes of education delivery such as e-learning, online courses and use of free access to resource materials.
- African universities should recognise the importance of integrating the development, application and use of local knowledge, new ethics and gender mainstreaming into its core business (teaching, research, community engagement and management).
- African universities should focus on enhancing multi-, inter- and trans-disciplinary approaches to teaching and research that promote cooperation and collaborative work between natural and social scientists, arts and humanities in order to address complex development issues (such as climate change and loss of ecosystem services).
- African universities should initiate participatory and demand-driven action research on sustainable development and climate change adaptation practices that engages and is meaningful to local communities; in addition to other research approaches that can develop knowledge on these critical areas.
- Teaching and learning should include the use of best practices, and critical evaluations of such practices that enable learning from practices in ESD.

Partnerships and Networks

- Partnerships and networking among higher institutions of learning, civil society and the private business sector in Africa need to be promoted as a framework for collaborative work on sustainable development and climate-change challenges.
- The MESA Universities Partnership should continue to internationalise and localise its activities in order to open more opportunities for partnerships across the globe, and in university communities and university communities of practice.
- There is need for recognising cross-sectoral forms of partnership and knowledge exchange that cut across cultural and social hierarchies.

Educational and Institutional Leadership in ESD and Policy Issues

- There is need for systemic capacity-building programmes for university leaders, government officials, civil society and other education-sector stakeholders to ensure sustainability and climate change issues are integrated in the teaching, learning and research programmes of higher education institutions, including private universities.
- Africa's education policy needs to be holistic and focus on the entire education sector (early childhood education, primary, secondary, adult and higher education) in order to develop capacities needed to face various environmental and developmental challenges, including climate change and loss of ecosystem services that impede development opportunities and affect livelihoods.
- There is need to engage higher education leaders and other stakeholders in the process of re-thinking and re-orienting Africa's development paths towards sustainability as well to create a sustained political platform.
- African universities' leaders should lead the development of enabling environment and sustainability policies for taking forward the MESA Universities Partnership work in universities; and help to create sound institutional frameworks that allow policies to be implemented.
- Governments throughout Africa should provide incentives for African universities that make meaningful contributions to ESD so as to encourage others.

Promoting and Enabling Student Participation

- Universities in Africa should provide opportunities for students to engage in sustainable development and climate change problem solving activities that are viable within their universities and communities.
- University management and lecturers should recognise, motivate and support student participation in university structures, clubs and other student activities that champion and respond to sustainable development and climate change issues.
- Support internships, volunteerism and inter-university/inter-faculty student exchange programmes among MESA University partners.

- Universities should reward student field visits and projects that contribute to mainstreaming of environment and sustainability, and provide students with high quality mentorship.

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Rio de Janeiro. *Unpublished theses:* Gobrechts, E. (1995).The recycling of domestic waste in the Cape Peninsula: Implications for environmental education. Unpublished masters thesis, Department of Education, Rhodes University, South Africa.
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