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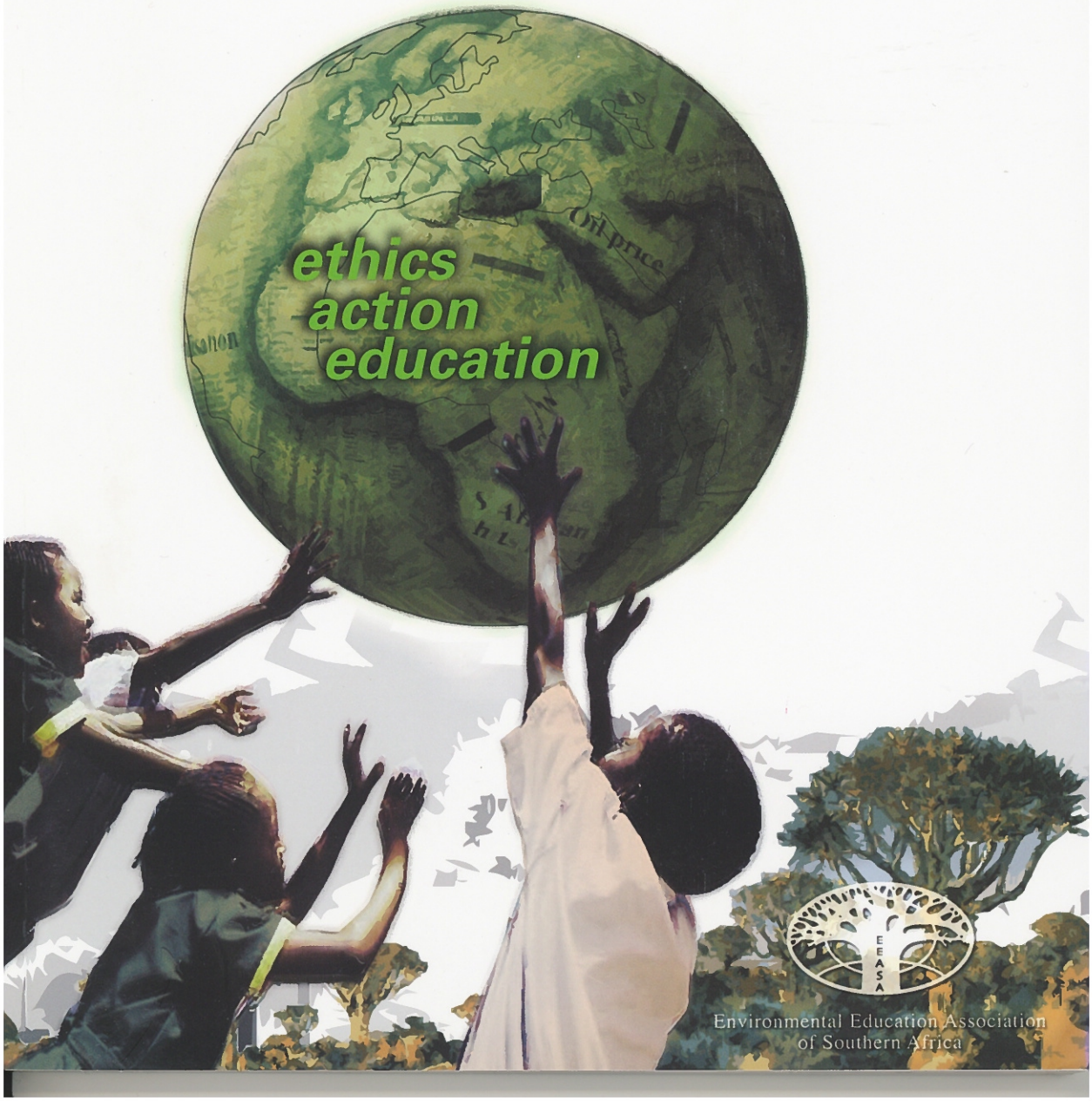

Southern African Journal of Environmental Education
Learning in a Changing World

Volume 24 (2007)

The Southern African Journal of Environmental Education (SAJEE) is an internationally refereed journal published once a year. The journal is published by the Environmental Education Association of Southern Africa (EEASA).

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, ethics and action 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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Learning in a Changing World

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Southern African Journal of Environmental Education, Vol. 24, 2007

Editorial

Heila Lotz-Sisitka & Rob O'Donoghue, Rhodes University, South Africa
Ian Robottom, Deakin University, Australia

The year 2007 is a significant year for environmental education. It marks 30 years since the first internationally agreed principles of environmental education were developed at Tbilisi, commonly known as the Tbilisi Principles. It is also the year in which human beings apparently are finally 'waking up' to the fact that human-induced environmental change is causing impacts which are infinitely complex and difficult to resolve. This year, through various highly publicised and politicised events, people have begun to recognise that it is getting hot on planet Earth, and that the associated social, economic and environmental costs are profoundly disturbing. The Stern Review and the UN Intergovernmental Panel on Climate Change both firmly indicated that human-induced environmental change will threaten human economies and security in ways that are unprecedented in human history.

Southern Africa, where this special edition of the EEASA Journal is being produced to coincide with the 25th anniversary of the existence of the Environmental Education Association of Southern Africa, and the hosting of the 4th World Environmental Education Congress, is one of the areas most vulnerable to the impacts of climate change. More than 70% of the people in southern Africa live in rural areas, and depend directly on natural resources for their livelihood and food security, making environment (and environmental education processes) a central concern in development discussions in the region. Patterns of global inequality are pronounced in the region, which has some of the poorest countries in the world. Out of its 25-year history, EEASA and its members, along with colleagues around the world, continue to seek ways of educating and empowering people to successfully participate in resolving environmental issues and create more sustainable and socially just living patterns. In drawing attention to our constant need to learn how to improve our understandings of environmental education and learning as the world around us changes, the World Environmental Education Congress organising committee chose to profile the question of 'Learning in a Changing World', by making this the theme of the Congress.

This edition of the EEASA Journal is dedicated to this theme. We invited Ian Robottom, a colleague from Australia, to co-edit the journal with us, within a process where members of the Scientific Committee of the 2007 World Environmental Education Congress (WEEC) were invited to submit 'Think Pieces' on the theme of the WEEC 2007. We asked them to include consideration of the 30-year history of environmental education in their Think Pieces. The resulting Think Pieces reflect an interesting mix of review, research and thoughtful questioning, constituting an intriguing set of papers to contemplate alongside the many other offerings that will be available at the World Environmental Education Congress.

This Editorial contains a brief introduction to the 13 Think Pieces, the four Feature Articles and a Viewpoint paper which make up this special edition of the EEASA Journal. As editor of the journal, Heila was encouraged to consider these contributions in relation to the WEEC 2007 theme and programme in an opening Think Piece. This opening Think Piece seeks to probe how we, as a global community of practice, can make sense of each other's contributions, and how we might consider engaging in dialogical processes with the published thoughts of others (such as those contained in this journal) and in the context of the World Environmental Education Congress. In doing this, it draws attention to the underlying purposes and possibilities contained in much of our writing, and the purpose and possibilities embedded in hosting large-scale global gatherings such as the WEEC 2007. It would seem that there is a need for seeking out dialogue with others in our field, given that the WEEC 2007 has attracted people from over 70 countries around the world who wish to meet and talk about their research and work in environmental education. This is also evident in the engaged response we received to the invitation to submit Think Pieces to this edition of the EEASA Journal.

The first section of the journal is dedicated to the Think Pieces that were accepted for publication, as they open possibilities for enhancing and deepening debates at the WEEC 2007. They are diverse in focus and content, but together form an interesting capital for dialogue, research and development in the field of environmental education. The first Think Piece by Samuel Ayonghe and Sani Amawa asks how environmental education is responding to the ever more present question of human adaptability to rapid environmental change. In a sense all the other Think Pieces and Feature Articles in the journal could be constituted as possible 'answers' to this piercing global question if they are to stand the test of time. The next two Think Pieces by Mario Salomone and Stephen Sterling provide us with the rich experience and thoughts of two practitioners who have 'been around', working in the field of environmental education for over 30 years, and, interestingly, both ask profound questions about the relationship between environmental education thinking and deep-seated cultural change, and both argue for radical re-orientations in educational thought and practice. Then there are a number of Think Pieces that focus on the complex and ever-vexing question of how people learn, and how we as environmental educators have been theorising, and can possibly come to theorise and interpret learning processes. Leading the discussion are the insights of Arjen Wals, developed out of the research process associated with editing a new book called *Social Learning towards a Sustainable World* (Wals, 2007) in a Think Piece which maps out an argument for social learning processes that might extend our reflexivity as we 'fumble towards sustainability'. On a similar theme, Paul Hart, with characteristic depth of insight and thoroughness, explores what we are learning about social learning processes, probing questions of relational politics and identity in processes of reflexive agency. Joe Heimlich and Martin Storksdieck argue that we need to change our thinking about learning in a changing world, through their paper mapping out developments in thinking in the context of free choice learning. Lesely Le Grange and Chris Reddy reflect on the changing environment(s) that form the focus of environmental learning processes, and the changing learning environment(s) that people find themselves in, also drawing attention to the changing cultural context of learning. Michael Jackson, through his explicit interest in post-colonial forms of education, also addresses the issue of learning cultures, and argues strongly for

transformative learning processes.

Mapping out some of the changing politics associated with current shifts in the field of environmental education, brought about through the recent rise to prominence of sustainable development discourse, are two separate but closely related Think Pieces by Ian Robottom and Edgar González-Gaudiano. The final two Think Pieces raise more explicit ethics-oriented questions for the field of environmental education. Bob Jickling's Think Piece probes the changes in research orientations in the field of environmental education over the past 30 years, leaving us with the critical question on how the prominence of (more explicit) normative questions might further shape environmental education research. Peter Blaze Corcoran and Philip Osano, through their narrative experience of working with the Earth Charter, raise the ethical question of intergenerational equity in a contemporary world environment which is plagued by extreme inequalities.

The second section of the journal contains four Feature Articles. For this edition of the journal we limited the number of Feature Articles due to the interesting response we received to the Think Piece invitation to reflect perspective and issues in contemporary debate. The four Feature Articles were selected for the way in which they add value to and extend the conversations in the Think Pieces. They provide useful insight into how research informs our thinking and *vice versa*. The first Feature Article, by Cecilia Lundholm, critically probes the intersecting construction of environmental learning processes when different disciplinary traditions meet. The second Feature Article, by Rob O'Donoghue, provides a critical historical analysis of what he calls 'outline schemes' or conceptual explanations that have emerged (largely through his earlier work) in southern Africa to guide learning interactions in environmental education. The paper shows an ever-deepening understanding of sociocultural learning processes in contexts of risk. The third Feature Article, by Charles Chikunda, questions the structural underpinnings of education systems, and the way in which educational philosophies in use in Zimabwe exclude community involvement in education processes, thus constraining efforts to re-orient education towards sustainability. The fourth Feature Article, by Mphemelang Ketlhoilwe, critically considers teachers' responses to the introduction of environmental education policy in a national education system. Through exploring power-knowledge relations in Botswana's education system, he explains teachers' normalisation strategies as they encounter new (complex) policy discourse.

The last section of the journal contains only one Viewpoint paper. This paper by Martin Clement is, however, equally integral to the 'whole picture' that the contributions to this journal paint. It highlights the significance of place meanings, identity and cultural landscape issues in the context of a small project in the Durban Botanical Gardens. As Durban is the host city to the World Environmental Education Congress, we felt it fitting to close the journal with this thoughtful and beautifully constructed Viewpoint paper on how our understandings of culture, identity and place meanings might influence the construction of education and interpretation practices.

Heila Lotz-Sisitka & Rob O'Donoghue, Rhodes University, South Africa
Ian Robottom, Deakin University, Australia

Think Piece
An Opening Dialogue with Think Pieces and Feature Articles on *Learning in a Changing World* in This Journal

Heila Lotz-Sisitka, Rhodes University, South Africa

> The dialogue is not aimed at settling anything. We explore meaning together – the creative perception of meaning – thinking together and feeling together. But meaning is … spontaneously active and transformative. (Bohm, 1990)

> David Bohm introduced a dialogue form that begins with no set purpose beyond the intention to explore thought. He proposed that seeing thought as a reflex (just a more subtle body reflex), could help us understand its operation, not as something mystical, and separate from emotions and bodily functions, but an integral part of a material system. (Styer, 1997)

On Dialogue …

In approaching this opening Think Piece, I spent some time critically considering the notion of thought and 'dialogue'. What would a dialogue with the other Think Pieces, the selected Feature Articles and a Viewpoint paper in this journal involve? How might such a dialogue be constituted, and *why dialogue*? This paper follows a recent reading of David Bohm's (2004) notable text *On Dialogue*. Since reading this text I have been fascinated by the way in which he, widely recognised for his contribution to quantum physics, considers reflexive thought and dialogue as important processes in global social transformation. It also follows much internal conversation and reflexive deliberation on the value and validity of organising an (expensive) World Environmental Education Congress in one of the most poverty-stricken regions in the world – southern Africa – which is also my home. Countless times I have thought about the ethical responsibility associated with the process of creating meaningful opportunity for global dialogue in a World Congress environment. What value will the Congress have? How can one create an environment conducive to *dialogue* within a global frame?

These ethical deliberations intensified over the past 18 months as global climate change rose in stature in the international media, breaking into political discourse, economic discourse and the space of personal ethical decision making. Ever conscious of the ecological footprint wrought by countless people flying to Durban for this congress in the face of recent scientific reporting on the risk and impact of global climate change on society, the task to consider the nature, quality and value of potential for meaningful dialogue at the Congress took on an even greater significance.

In this process, I drew some inspiration and methodological guidance from Bohm's extreme realism. As Senge states in the introduction to the 2004 edition of Bohm's essays: 'He knew that no society has ever faced the sort of global predicament we face, and that we are not likely to muddle through without radical changes in our way of being – together' (Senge, cited in Bohm, 2004:xiv).

In trying to conceptualise a social process that seeks global 'truth' about the state of humanity and its environmental relations, Bohm discusses the kind of relational dialogue necessary for global society to change its direction away from the incoherent, destructive bent it is currently on. The dialogical process he defines is essentially a relational process of re-learning to allow for deep-seated cultural changes. He argues that to achieve this deep-seated cultural change, dialogical processes are needed in our daily lives and work, and in society more broadly, that allow us to examine the very nature of our thought, the way in which we listen and engage with others, and that allow us to probe the not so obvious, the tacit or what he calls *the implicate order*. He proposes that if such cultural change were to take place, 'the kind of waste of energy which is going on in the production of armaments could be cut down. If we could stop the tremendous amount that's being spent on armaments – let's say a trillion dollars a year – that could be used for ecological regeneration and all sorts of constructive things' (2004:52). He does not propose an 'ideal state' but rather a process of dialogue and learning to slow down the destruction, inequalities and violence characterising late modernity and, through this, the charting of a different direction for humanity.

Methodological Guidance from On Dialogue

So what methodological guidance did I find in the Bohm essays *On Dialogue?* While his methodological suggestions are directed mostly to establishing face-to-face social processes that allow for meaningful *dialogue*, I have found some aspects of his work useful for engaging with the papers in the journal, and for thinking through issues associated with the dialogue opportunity afforded by a World Environmental Education Congress (WEEC). I will simply map some of the ideas that I found useful in the Bohm (2004) text here, to share with readers the vantage point used for interpretation in this paper.

- Dialogue does not only mean two in conversation. It comes from the Greek word '*dialogos*'. *Logos* means 'the word'. And *dia* means 'through' (p.6). In considering dialogue, we are therefore considering *a flow of meaning constituted in language through the word* …
- A dialogue gives attention to the whole process, not just to the content of all the different thoughts, opinions and views – and to how we hold it all together. Thought, and the way we think, has a profound effect on the possible flow of meanings. For example, if we allow fragmentation (which originates in thought) to influence the way we think, certain meanings result (e.g., nature and culture are separated; education in schools and out of schools are separated; society, environment and economics are separated, etc.). Dialogue pays attention to the meanings, as well as their origins, and how the flow of meaning holds together.

- The purpose in engaging in dialogue is not necessarily to try to change anything, but rather to become more aware of what exists, of relations between things, of incoherence and new possibilities for creativity and coherence.
- The object of dialogue is not to analyse things, or to constitute or win an argument, or to exchange opinions. Rather it is to suspend all opinions (one's own and others') and to see through the word what it all means. Bohm says that 'If we can see what all our opinions mean, then we are *sharing a common content,* even if we do not agree entirely … if we can see all the [opinions] … we may than move more creatively in a different direction' (p.30).
- When listening to what others are saying, we need to suspend our own viewpoints, self interests and assumptions about what (we think) might be better, until we have carefully and slowly considered what others are saying. Bohm says that too often our self interests and assumptions take over and cloud what we hear, leading to defensive postures and oppositional thought, which only serve to break down the potential for meaningful dialogue.
- If we are able to think together in a coherent way (not uncritically or all in the same way), it would have tremendous power in enabling a more coherent movement of thought in society. This coherence is necessary not only at the level we recognise (the explicate order), but at the *tacit level*, at the level for which we only have a vague feeling (the implicate order). For example, at the *tacit level* in our society at the moment a monetary, profit-centred economy is simply an accepted norm that structures societies and the way they operate around the globe. Is it possible that other (differently constituted, more coherent) thoughts could become as tacitly and widely accepted? Bohm explains that the tacit is often the unspoken, taken-for-granted dimension of culture, so if we can be more alert to and reflexive of the flow of meaning at the tacit level, then maybe thought can change. He explains how tacit coherence has gradually fragmented and become incoherent because societies got too big and complex, and thus, he argues, we need to renew the project of seeking out and reflexively reviewing the tacit assumptions (the implicate order) that shape the way society is structuring itself, our identities and our possibilities for agency. He gives primacy to reflexive meaning-making processes that account for, and take account of, the tacit, the implicate order (not only the explicate order, or the more visible).
- Dialogues are consequently experiments in seeking deeper insights, meanings, probing the tacit, the underlying flows of meaning reflected through our words, the questions and relations that constitute what is visible in the everyday or in our thought expressions (i.e., our writings or verbal expressions), in the interests of seeking 'truth'.
- In dialogues everyone is quite free. It is not a 'mob' situation where the collective mind takes over – rather dialogue is something *between* the individual and the collective. It can move between them. It recognises the existence of both an individual and a collective mind, and a flow between them. Cultures are constituted by shared meanings. Bohm raises a question about the coherence of contemporary culture, stating that 'the culture in general is incoherent …', noting that this brings a corresponding incoherence into culture at a micro-level. In doing this he argues for more careful consideration of what occurs between the individual and the collective.

I have drawn on some of these perspectives to consider some 'flows of meaning' that are apparent in the words shared in this journal. My purpose is not to change anything, but to listen, and to see if new possibilities for coherence (not sameness in thinking) occur. In doing this, I am experimenting with seeking deeper insights, meanings, probing some possible underlying questions and relations embedded in the set of papers submitted to the journal. My purpose (which is part of the broader purpose of this journal and the WEEC 2007 process) is to consider the 30-year project of environmental education and social change, as expressed by authors across these journal pages. My interest is to see whether we can (at least to some extent) *at this point in time*, *share a common content* in the field of environmental education (but not necessarily the same viewpoints, research approaches or thoughts). I frame my dialogical encounters with the papers as dialogues (e.g., Dialogues 1, 2, etc.) and invite readers to continue the dialogue during the World Environmental Education Congress and beyond.

In doing this, I am proposing that we continue to examine the patterns and consequences of our thinking, listen carefully to each other, suspend our own assumptions and 'positions' while we listen, seek out the tacit, or the implicate order, and allowing for a freedom of movement between the individual and collective, all the while seek greater coherence (not to be equated with sameness).

Dialogue 1: Complexity in relationships between environment(s) and culture(s)

One of the *flows of meaning* that appear to be explicitly considered by almost all of the authors in this journal is the 'nature of the beast' that we are dealing with in environmental education, although all authors express this in slightly different ways. Most authors comment on the complexity of the (environmental/sustainability) issues being dealt with, particularly since the issues intersect complexity in natural systems, and complexity in modern cultural formations and institutional set-ups that we live and work in. For example, Sam Ayonghe and Sani Amawa discuss the problem of depleting water resources in Cameroon, tracing the natural and human-induced factors contributing to this problem, and the cultural and social implications of this issue. They comment on the potential loss of culture, heritage and livelihoods as people are left with little choice but to become environmental refugees as the sharp realities of the interrelated poverty-environmental relations manifest in this context. Arjen Wals talks about the 'complex and ever-changing relationships between humanity and nature and between people', while Stephen Stirling draws our attention to the earlier writings of Barry Commoner who simply noted, for example, that 'everything is related to everything else'. Mario Salomone describes these relations as 'The complexity of the phenomena of the inextricable culture-nature, human society-environment *continuum* …' while Lesley Le Grange and Chris Reddy comment on the changing nature of our understanding of environment over time, drawing attention to the socially constructed (and often politically constituted), contingent nature of these understandings. Bob Jickling cuts to the core of the debate, noting that we ought to give greater attention to normative issues in education, 'especially in the context of urgent socio-environmental issues such as global climate change and growing inequity between geopolitical regions of the world'. He suggests that to address issues of complexity we might include

'predilections for contextually developed approaches to normative questions' (Jickling, this edition).

The Think Pieces by Edgar González-Gaudiano and Ian Robottom draw attention to the extreme political edges of human-nature relationships when they critically analyse the influence of an increasingly dominant political-economic-institutional alliance that is underwriting and supporting a primarily economic interpretation of sustainable development discourse which is beginning to marginalise environmental policy and environmental education practice. Peter Blaze Corcoran and Philip Molo Osano, through the medium of the Earth Charter ethics, consider another political edge of this human-nature relationship when they talk of intergenerational equity, in contexts where there is enormous inequality amongst present generations (never mind future generations!), with Bob Jickling's Think Piece reminding us of yet another political edge, our consideration (or non-consideration) of the more-than-human.

So what is tacit here? What implicate order could become more visible if we were to take the time to engage in the kind of dialogue envisioned by Bohm?

My reading is that as humans we are apparently not (yet) succeeding in articulating our relations with the non-human or more-than-human world in coherent ways. Stephen Stirling, and Bohm himself, traces this to deficient worldviews based on 'separation, control, manipulation and excessive competition' (Stirling, this edition), or fragmentary/separatist logic. Could this help us to ask why an apparently incredibly complex array of political, economic and cultural interests (embedded in our thought patterns) are (still) subverting our capability to co-define more clearly our interdependent relationship with the non-human world/space/ecosystems that we inhabit? You may find glimmers of insight in your reading of the papers in this journal, or in the WEEC 2007 presentations … if you join into the spirit and process of this dialogue …

Dialogue 2: The slow nature of systemic change in educational systems, thinking and practice

Another *flow of meaning* dealt with explicitly in a number of the papers is the slow response in educational systems, thinking and practice to the contemporary challenges facing society (as expressed in the environment and social justice agendas). Again this is expressed by different authors in different ways. For example, Stephen Stirling (this edition) comments that few of the institutional documents that promote environmental thinking have critiqued the education system that it seeks to influence. He states that 30 years after Tbilisi '… the environmental and sustainability movement, with a few exceptions, is still not good at critiquing the context it seeks to influence'. Charles Chikunda, in his empirical study of a teacher education programme, most clearly expresses this point in findings which show that teachers, and their supervisors, are still tied to outdated educational philosophies and theories, a situation which is exacerbated and held in place by structural features such as the examination system and existing (colonially derived) education cultures. His research shows how this legacy lives on in schools, prohibiting

or constraining a re-orientation of education towards sustainability, and excluding parents and communities from having an educative relationship with the learning processes in the school. Mphemelang Ketlhoilwe's research also points to the difficulties teachers experience when having to adapt to/adopt new environmental education policy without adequate orientation and support, showing how teachers' normalisation strategies are an integral part of the power-knowledge relationships that hold existing educational structures and cultures in place. Lesley Le Grange and Chris Reddy suggest that very little of what has been explored in the academe may have filtered down to schools, and Mario Salomone says that models in schools 'that are based more on *having* rather than *being* lead to a vision of the world that fuels competition, marginalisation, dissatisfaction, etc.' (this edition).

So what is tacit here? What implicate order could become more visible if we were to take the time to engage dialogue on this question?

My reading is an historical one, which I trace back to the purpose of schools in society, their subsequent appropriation by the emerging nation state for purposes of cultural reproduction, their current disarray due to the difficulties in maintaining social order on a massive scale such as that assumed of formal education systems, with a consequent lack of appropriate support and orientation for teachers to make the expected transitions. How can a system, geared primarily towards maintaining a reproductive and social control function in society, be 'set free' to be rapidly responsive to emergent needs of society (e.g., to enabling equity, reducing environmental impacts, etc.)? What implicated order needs to change?

Mario Salomone in his paper (this edition) speaks of engaging with the 'school ecosystem', and Stephen Stirling, Arjen Wals and others talk of thinking more systemically about our working with schools and other learning institutions. In our dialogue we could take the time to consider that the education system (as we know it today) was created through our words and how we think, and that it could be changed if a more coherent vantage point on the value and purpose of education could be developed for the late-modern era (with its attendant diversity, changing culture, emergent reflexivity and other features).

Dialogue 3: Environment and sustainability … how should we conceptualise the relationships in our field

Fifteen years after the Rio Earth Summit, there seems to be much uncertainty in the field as to how we should conceptualise the relationship between environment and sustainable development thinking. In some cases, authors in the journal appear to have resolved the dilemma by using both environmental education (EE)/education for sustainable development (ESD), others traverse the terrain confidently using the concept of sustainability, while others refer to environment and sustainability as two separate, yet related, concepts, and others consider environmental education to be a vehicle for achieving sustainable development. Edgar González-Gaudiano provides an in-depth analysis of the shifting discourse of sustainable development, its origins in the environmental movement, and its more recent appropriation

by the market, marking out a complex, ideologically imbued, shifting terrain. Wals and others refer to sustainable development as a learning *process* (i.e., open-ended and still to be clarified as people come together in co-defining deliberations).

Rob O'Donoghue and Ian Robottom both comment critically on this contested space, by noting that so much of the problem lies in the dialectical politics of naming games at the level of new movements and changing slogans that are not always in the best interests of the environment. To complement this, Edgar González-Gaudiano's genealogical analysis provides a richly textured picture of changing human struggles and conceptions of how best to manage their relations with the environment. It reminds us that environmentalism is a new social movement, of relatively short duration in the bigger scheme of things, and the terrain is still uncertain, unclear and unchartered, although we seem able to detect powerful influences and forces at play that are re-defining the environmental agenda within the current global neo-liberal development 'flow'. Writing from Latin America, González-Gaudiano argues that environmental education's task is to develop capacity for critical and reflexive engagement with the increasingly complex and changing discourses of environment and sustainability (not unlike an argument I made in an earlier paper on the same question (Lotz-Sisitka, 2004), writing from southern Africa). Arjen Wals re-assures us, noting that the conflict and tensions that arise around environment-sustainability issues and discourses in the field are critically important for stimulating learning and agency, an important dimension of the critical reflexivity that González-Gaudiano proposes. These perspectives are not unlike Rob O'Donoghue's emphasis on the way risk encounters and moral imperatives give rise to culturally situated reflexive learning processes.

But what is the implicate order here? What is at the root of the environment–sustainable development debate in the field?

My reading is that human society is trying to re-conceptualise its relations with the environment (evident from the changing discourses over the past 30 years and more). However, as we know from a myriad of critical commentators on the state of modern globalising society, the dominance of neo-liberalism is extremely powerful, unbalanced and unequal, and does not easily allow the space for new social movements to flourish. Through established and taken-for-granted cultures of dialectical and conceptual fragmentation, powerful academic-media-institution matrixes, and individualisation, this trajectory appears to foster division at macro- and micro-levels, which tends to sustain dominant trajectories, through various (often tacitly constituted and paradoxical) appropriations of new social movements and their interests. Thus, critical reflexivity becomes a key resistance strategy and a cornerstone for enabling agency, keeping the possibilities for ongoing re-defining of a field such as environmental education open, responsive, varied and interesting, as Bob Jickling always reminds us to do.

Dialogue 4: Education, learning, identity, politics and reflexivity

Bob Jickling connects with another *flow of meaning* in many of the journal contributions when he comments in his Think Piece that education (and environmental education) 'is an essentially contested concept that has developed and changed over time' and that 'there is a sense that the concept of education has been continually re-created' (this edition). He suggests that the time is right for re-invigorating the process of re-creating education, and shares some lovely vignettes of how this can be done through creating previously unspoken concepts, or through testing analyses against new information and hard cases. It seems that such a creative moment is taking place in the field of environmental education around considerations of human learning processes.

What seems to be an interesting feature of the papers in this journal is that authors are all working at developing a new language for explaining and talking about human learning, which is significantly different to the earlier language given to us by behavioural and cognitive scientists. Some express it by marking out the shifting terrain towards constructivism. But there is a more interesting trend, emergence of a new language characterised by phrases such as 'conscious agents of our own cultural evolution' (Stirling, this edition); 'reflexively fumbling towards sustainability' … 'require a more systemic and reflexive way of thinking and acting' … 'meaningful interaction' … 'communities of learners' … 'open-ended and transformative' … 'creativity and change'…'collective goals and/or visions' … 'conflict and dissonance' (Wals, this edition); 'thoughtful social action' … 'the problem of agency' … 'relational knowing/learning' (Hart, this edition); 'sense of place identity' (Clement, this edition); 'sense of place' … 'learns … to be a participant in a changing world' … 'contributing to cultural change' (Salomone, this edition); '… deliberative meaning-making … reflexive social learning processes … planned and undertaken in response to risk within a community of practice' (O'Donoghue, this edition). Bob Jickling, Rob O'Donoghue and Arjen Wals (amongst others) seem to be proposing that considering and negotiating complexity, risk and unintended outcomes in education is closely intertwined with the deliberation of normative questions (ethical questions), and the emergence of action competence (agency).

Paul Hart, adding a political slant to the language of reflexivity and co-engaged learning processes outlined above, articulates what we seem to be talking about as follows: 'we need to learn how each of us is complicit politically in constructing subtexts by which our actions are judged to be reasonable. Such learning is not neutral and is contingent on processes of participation that engage people in thoughtful social action' (this edition). His paper probes the reflexive learning process more deeply, seeking out the relationship between identity construction, learning and reflexive social actions (agency), noting that identity is situated, historical and contemporary and always in flux, an insight which sheds significant insight into the learning processes we seem to be discussing in this journal.

While Paul Hart points to the significance of subjectivity and identity, Lesley Le Grange and Chris Reddy point out that the homogenising and normalising effects of Integrated World Capitalism (after Guattari, 2001) is producing human subjectivities that are 'domesticated, that is, passive, dull and uninspiring', leading to a decline in ecological literacy, an issue also lamented

by Mario Salomone in his Think Piece. This would seem to create even deeper challenges for educators anxious to consider the potential of agency for social and environmental change. This is especially so when one considers the point made by Lesley Le Grange and Chris Reddy that 'learners are exposed to environments that are radically different to the way they were 30 years ago', characterised by new forms of social organisation and structures, rapid urbanisation, new technologies (e.g., Internet, cell phones) and globalisation of events, consumption patterns, economics, culture and politics. They mark this out territory as being laden with 'potential carriers of new possibilities', new ways of living and new forms of agency (this edition). Michael Jackson comments further on this issue, noting that it is not really a question of learning to adapt to these changes, but rather learning how to challenge the *direction* of such change, and that there is a need to visualise an entirely different trajectory and learning theory for developing the courage (and agency) to pursue such a vision effectively. Cecilia Lundholm's work on students' encounters with different epistemic cultures provides an interesting empirical vantage point on the more ideologically constituted or theoretically constituted attempts at explaining the learning process shifts, highlighting 'commitment' as being an integral dimension of such learning processes.

Joe Heimlich and Martin Storksdieck add another dimension to the discussion on learning as they engage with the issue of broader sites for learning, the intentions of learners and educators in 'free-choice learning' processes. Significant is their point that learning does not only take place in school-like settings, which they see as a too-narrow perspective '… in a world where lifelong … learning … is becoming increasingly more important, and increasingly more recognised' (this edition).

What is tacit here?

My reading is that learning theorists are seeking deeper explanations for learning, exploring how complexity, risk and ethical questions, prominent in late-modern cultural and socio-ecological contexts can be mobilised through various forms of co-learning to enable generative responses amongst individuals and communities. The institutional borders that previously confined learning to formal institutions are breaking down, and learning sites are becoming more flexible, moveable and are being differently configured to those that characterised the 19th and 20th centuries. This is not, however, all pervasive; as we have noted above in Dialogue 2 schools and some other formal learning institutions (e.g., universities) are still excluding communities, and more generative approaches to learning are confined by institutional form, culture, inequality of opportunity and lack of capacity for rapid adaptation to societal change. The challenge would seem to be how to reconcile progressive and interesting learning theories with existing institutional cultures that pervade education systems and structures. Can our institutions become social learning institutions?

How to Bring It All Together? An invitation to dialogue around some emerging questions

So, how do we begin to bring this together? Is it possible to state that we share *a common content* in the field of environmental education *at this point in time*? From my reading of some of that which seems tacit across a number of these journal papers (expressed in the four diaolgues above), I propose that some of the contours of this common content could potentially lie in engaging with the questions:

- How can we more coherently conceptualise nature-culture relations (or our relations with the non-human/more-than-human world) in a context of extreme complexity?
- How can we more coherently engage the current nature of formal education institutions and systems to enhance their contributions, value and possibilities for engaging environment and sustainability questions in the 21st century?
- How can we counteract and transgress fragmenting logic affecting our field, which has led to separations such as environment *versus* sustainability (EE *versus* ESD), and the environment/society/economy division emerging in sustainable development discourse? How do we avoid this form of logic from weakening a field that has developed great integrative strength and insight in a relatively short historical time-space configuration (30 years since Tbilisi)?
- How do we continue the project of engaging people in reflexive learning processes that are ethically constituted in response to risk and inequality, that take account of identity, history, politics, culture and context, *and* that are generative of meaningful alternative ways of living and being? Can we deepen our understandings of agency, its emergence and potential for reflexive encounters? And how do we do this coherently in the context of formal education systems, *as well as* community learning and free-choice learning contexts?

Underpinning the above, is the constant process of reflexively reviewing what is being constituted through the word, what flows of meaning are present, and how changes can be constituted in the implicate order (not only the explicate order), to use Bohm's framing. Stephen Stirling, in his paper (this edition) argues that we need to go

> … beyond mounting calls to 'change our way of thinking and doing' (which have been with us before and since Tbilisi) to uncover the roots of why we are as we are, and, from this basis, clarify the nature of a shift of collective consciousness which is already underway, in order to accelerate it further.

This opening Think Piece invites you into such a dialogue, with this journal, its words and flows of meaning, and with the World Environmental Education Congress, its words and flows of meaning. Dialogue, as explained by Bohm, and as illustrated in the thought experiments in this paper, is a process of creatively and experimentally seeking out meaning and coherence through listening, and through deeper explorations of the tacit, implicate order. It is also a free process, where you as individual are invited to seek out the relations between your thoughts and the collective. Welcome to the process …

Final Note

While this opening Think Piece intended only to consider the contributions in this edition of the EEASA Journal, I could not help but notice similarities with other published works in the field of environmental education – the recent 10-year Special Issue of *Environmental Education Research*, an established journal edited by Alan Reid and Bill Scott (2006), being notable here. This Special Issue also deliberated nature-culture complexities, and the EE/ESD debate in the field of environmental education, learning processes and other themes. Another more recent Special Issue of the *Environmental Education Research* journal edited by Bob Stevenson (2007) deliberates similar questions to those raised here about change in formal education systems. The indications are therefore that the dialogue here has a reach far beyond the words in this journal.

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Think Piece
Human Vulnerability to Depleting Water Resources in Cameroon: Sensitisation approaches

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Introduction

The ecological diversity of Cameroon is linked to its geology, morphology and climate. This diversity is unique, not only in the central African region, but on the African continent as a whole. It ranges from wetlands along the Atlantic coast in the south, through equatorial rain forest, to savanna in the Sahel, and then to desert scrub in the southern fringes of the Sahara Desert at the extreme northern end of the country around Lake Chad (Figure 1). This uniqueness is also reflected by the variations in the culture of the people who speak over 250 languages.

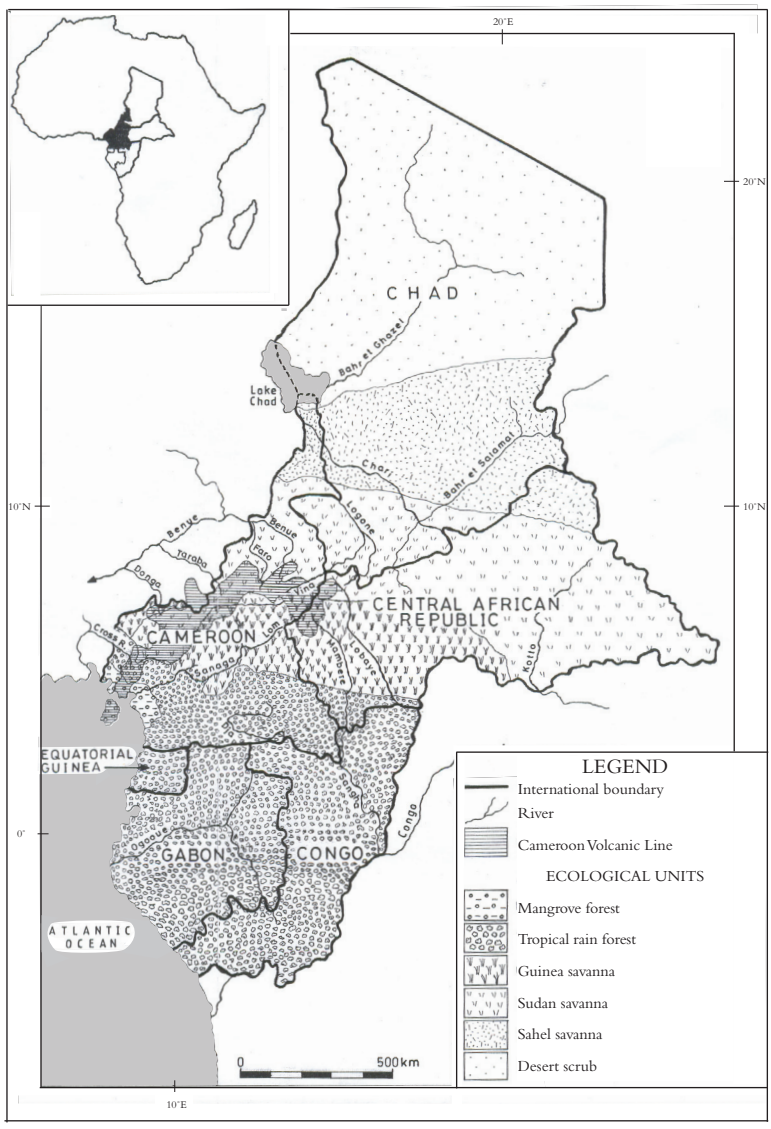
The determinant factor for the distribution and concentrations of both urban and rural populations, as well as their livelihood, is accessibility to water supplies. The potential of these resources is dependent on the types of aquifers which, according to Ayonghe (1998), are recharged by rainfall in sedimentary rocks, fault zones in Precambrian crystalline rocks, weathered Cretaceous granites and Tertiary volcanic rocks. Phreatic aquifers constitute the main catchment areas in the country, especially along the dominant morphological high termed the Cameroon Volcanic Line. According to Ntasin and Ayonghe (2001) rivers radiate from this major catchment in all directions (Figure 1). The groundwater within this main catchment area has, over the past few decades, been observed to be under stress – as indicated by the depleting volumes of water in the rivers. Complete or total disappearances of perennial springs, leading to dried-up streams and drastic decreases in the volume of rivers, especially during dry seasons, are common (Ayonghe, 1998). In fact, hydrogeological events within the last 10 years have left almost every critical hydrological observer with the conclusion that the stock of water resources in the country has been declining. The marked reduction in the size of Lake Chad, located at the northern end of the country, the growing potable water crises in both urban and rural communities, the reducing volumes of water in nearly all rivers leading to shortages of electricity supplies from hydroelectric generating stations, and the increasing southward migration of communities from the north, are also strong pointers to the fact that a major water crisis is looming. Consequently, there is need to pay urgent attention to this problem.

This paper constitutes a critical review of the causes of the depleting water resources, the trends related to some of the causes, projected impacts in the near future, and the possible impacts of such trends.

The results are used to propose possible approaches to, and challenges for, environmental education aimed at highlighting potential adaptability approaches that could be used to reduce the vulnerability of the population to these changes. Problems related to approaches of raising

awareness are discussed. A proposal is put forward for considering a lifelong learning process involving the most affected communities in order to ensure the preservation of their cultural heritage even when they are forcefully displaced (from excessive arid conditions), rather than allowing them to be caught up as refugees before they attempt to adapt. Approaches of sustainable water management options are proposed as the most appropriate mitigation actions that could either slow down or reverse the situation, with an associated suggestion that such strategies become the focus of environmental education programmes.

Figure 1. Ecological zones of Cameroon within the Central African Region, and the Cameroon Volcanic Line catchment



The State and Uses of Water Resources in Cameroon

Water is an essential resource for both plant and animal life. Fresh water is a precious resource and those who have it in abundance take it for granted, but when the resource starts depleting in quantity, it renders them vulnerable. Water use varies for each locality and according to a World Bank Report (1998; cited in Nji & Fonteh, 2002), from 1970 to 1998, 46% of fresh water in Cameroon was used for domestic needs while 35% was for agriculture purposes.

Most of the people in Cameroon are farmers. Large areas within the main catchment region of the country (e.g., the Adamawa Plateau, the Mandara Mountains and the Western Highlands) have been used for extensive agricultural systems. Such agricultural activities account for more than 70% of deforestation, especially on the Bamenda Highlands where most of the montane forest occupying peaks of topographic highs has disappeared (Ndenecho, 2007). In the past, these forests served as effective watersheds which ensured sustained regular water flow from perennial springs.

Irrigation farming systems along the Logone and Chari Rivers (which flow northwards into Lake Chad), when associated with dams used for abstraction of water for the cultivation of rice, are responsible for the dwindling volume of the water downstream into this lake. The surface area of the lake reduced from 25 000km^2 in the 1970s to barely 2 500km^2 today, a tenfold reduction in barely 30 years. Similar impacts of water abstraction from streams and rivers for rice cultivation are also evident in rice projects along the middle reaches of the Sanaga River and at Tingoh along the Menchum River.

It has also been demonstrated that inappropriate farming methods lead to reduced water retention capability (Dudal, 1980). Pastoral farming within the watershed has been shown to reduce infiltration after rainfall due to the trampling effect from high intensity grazing within these areas (Amawa, 1999).

The expansion of both urban and rural settlements within major watersheds in the main catchment region of the country is also responsible for the depletion of the water resources in these areas, as paved surfaces and farmlands have replaced the ideal forest which favoured infiltration, resulting in the disappearance of most springs, even during the rainy season.

Water Resources Depletion: Causes and impacts

Weather conditions such as rainfall and temperature have been considered to be some of the environmental (natural) factors which affect groundwater resources in the country (Ayonghe, 1998). Other factors include deforestation, overpopulation, overgrazing, uncontrolled farming practices and the planting of eucalyptus trees (Lohman, 1990; Ayonghe, 1998; Amawa, 2001). Environmental changes have led to irregular and/or low precipitation patterns (Ayonghe, 2001). Over the last few decades, these changes have manifested themselves as drought, and sporadic climatic changes which have led to geo-hydrological disasters such as floods and landslides. Using the coefficient of determination, Amawa (1999) discovered that 16% of the decrease in the discharge of springs over a 30-year period was accounted for by this trend of reduced rainfall.

Other impacts of depleting water resources include desertification, famine, loss of biodiversity, and migration of communities to greener areas. In the Sahel region of the country (Figure 1) it is common to find people and cattle tussling over existing stagnant water resources during the peak of the dry season. Such tussles usually lead to fatal conflicts and, together with high cattle mortality rate, often force people to migrate to more humid areas (Eze, 2001). In rural communities of mountainous areas, close to 40% of water problems are common during dry seasons and periods of drought (Acho-Chi, 1983).

In the coastal region, excessive overpumping of groundwater from wells located in unconfined aquifers during the dry season usually leads to a drop in the water table, resulting in saline water intrusion to contaminate the freshwater resource (Engome, 2006).

Sensitisation Approaches and Challenges for Environmental Education

A variety of water harvesting techniques have been implemented as an approach aimed at remedying the situation within the Sahel region where precipitation is generally low (Nji & Fonteh, 2002). The results have been encouraging, with increased water supplies to communities for longer periods of the year. This success is however limited to regions with unconfined aquifers. Other approaches will therefore have to be considered for areas without such aquifers.

The future availability of this precious resource can be ensured if appropriate approaches of Sustainable Water Resources Management (SWRM) are adopted. According to Hirji and Malapo (2002) this encompasses two related components which are in a dynamic tension and which must be brought to balance: the utilisation of the resources for the various human needs while at the same time protecting them in order to ensure continued utilisation by present and future generations.

Government policies have, over the years, been focusing on ensuring provision of adequate potable water to both rural and urban communities. Although the cost has been enormous, the success rate has been far from satisfactory, especially in cases where groundwater is targeted for such provision.

In order to ensure the effective implementation of SWRM approaches in the Cameroon context, it will be necessary to use various environmental education approaches to involve and sensitise user communities in the effective sustainable management of this precious resource. Although such involvement and sensitisation will be locality or region specific, the overall approach could be similar across the entire country.

The following issues are considered for such programmes:

(1) The water cycle and its importance
(2) Watershed/catchment areas: Their importance, methods of conservation and protection (management)
(3) Aquifers: Types, and management options
(4) Surface and groundwater quality considerations
(5) Human pressure being exerted on water resources: The need to reconsider past uses and habits

(6) Climate change and its impacts on depleting resources: Future trends of these changes and projected consequences
(7) Examples of successful SWRM options in other parts of Africa (e.g., SADC) and other arid areas of the world with emphasis on the need to adapt instead of becoming an environmental refugee
(8) Participatory design of policy options and legal framework

The sharing of knowledge amongst both urban and rural communities about water resources and best management practices, through discussions and educational programmes, could ensure the sustainable management of this precious resource which, from observed trends, is dwindling in quantity and quality at an alarming rate especially during the past few decades. Generally, good management of even scarce water resources can generate sufficient supplies to communities.

Catchment/watershed management programmes stand out as the most crucial aspects of this approach but, regrettably, this consideration is completely absent from the official water policies of the country, leaving these areas vulnerable to human-induced degradation activities. With an ever-increasing demand for this resource by both urban and rural communities, the current trend of migration of communities southwards to greener pastures is simply a postponement of the problem. Instead, an understanding of the nature of the resource, causes of its depletion, and remedial approaches to be considered, could, in some cases, restore this resource in localities where springs have dried up. This is essential since the underlying aquifers are intact and only require favourable surface conditions for adequate infiltration.

Conclusion

By opting to stay, learn, accept and adapt to natural (environmental) changes affecting water resources, communities will be more able to preserve their cultural identity and heritage. In this way, they will be more able to preserve their livelihood, and ensure effective industrial development, sustainable growth, food security and poverty alleviation, instead of being affected by the insecurities of migration to new and sometimes hostile regions to start new lives as environmental refugees. This, in our view, is the challenge for environmental education in a changing world!

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Think Piece

The World without Deposit and without Precaution From Rachel Carson to the 4th WEEC: A journey of learning in a changing world

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Signs of Collapse

My environmental commitment started long ago. Those were the years of Rachel Carson's *Silent Spring*, when the concern of more sensitive people focused (not necessarily in order of importance) on water pollution caused by detergents, on the carcinogenic effects of pesticides in agriculture and artificial colourings and preservatives in foods, on nuclear danger, on hunger in what was then called the Third World, where decolonisation was in progress. Television brought into homes black and white images of tanks in the streets or crowds in revolt; of great personalities sending out messages of peace and justice and feeding the hopes of democracy. Today the images of the first come in colour, but those of the second are in short supply.

They were the years of great change in countries that are now part of the G7 or the OECD.[1] Cement and asphalt were on the rise, supermarkets were opening and small shops closing, loose foods (sold by weight and wrapped up on the spot) were disappearing from the shelves and ready-made foods were taking their place. For one Italian writer (Pierpaolo Pasolini, murdered in 1975), those were the years of the 'disappearance of the fireflies' – that charming insect that no longer lights up the hot summer nights because of the pollution and the urban sprawl. To paraphrase Rachel Carson, we had entered the era of the 'dark summer'.

For me, a young boy at the time, it was also the era of the 'no deposit/no return' disposable bottles of beer or milk, etc. For the wealthy world this was the sign of achieved affluence. Millions of people were breathing a sigh of relief. After two world wars, after the difficult 1950s (which millions of immigrants had spent in mine shafts or on assembly lines), it was the sign of liberation from sacrifice and woes.

Instead, it was the sign of the next collapse.

Taking a closer look, in these aspects of a changing world we find everything: imbalances and social injustices, violence, political dramas, ecological disaster, the loss of biodiversity, the non-application of the precautionary principle, the enormous and senseless waste of financial resources in armaments and luxury, a superficial lifestyle, the waster who is attentive to enrichment and image, to competition and conformism ('keeping up with the Joneses').

Today the list of dangers and devastations is longer, not shorter, because new ones have been added and we are more familiar with the old ones.

Back then I loved the mountains (where my parents took me on vacation) and watching the cows at pasture. I saw the sea for the first time only later and loved it as well (so much so that years later I wrote a novel whose main characters were dolphins and whales). Having reached

the age of majority, I made two decisions that were a silent dissociation from the affluent society: to study philosophy, especially the humankind–nature interrelationship, and to teach.

The Teaching-Learning Process in a School (and in a University) Viewed as Environment

My starting point for arriving at a nearly total commitment to environmental education was the idea that the educational process cannot be separated from the environment-school and its 'ecology'. As a practical field I took what was closest to me: the *school ecosystem*. Learning is a co-learning and therefore a common research method that brings into play both the teacher and the student, but also the construction of a 'sustainable' coexistence in contra-position to the loss of sociality and relationships in civil society.

'Sustainable education', which is the subtitle of the monthly magazine '*.eco*' that I edit, is attention to the ecology (and to the global coherence) of the aim and mission of educational systems, contents, methods, reciprocal relations, administrative management, overall organisation, physical spaces, behaviours, school consumptions (or, why not, university). Schools and universities are made of contents and methods, but also of concrete places, buildings, with their problems of livableness, ergonomics, pollution, energetic efficiency, contribution to entropy, etc.

Even in the schools, however, models that are based more on *having* than on *being* lead to a vision of the world that fuels competition, marginalisation, dissatisfaction, etc. Schools must propose a different, inclusive model that is respectful of diversities, yet at the same time involved in creating equal opportunity; a model that is open to creativity and to the emotional involvement of youth, and founded on the critical spirit and on a familiarity with the uncertainty, interdependence and complexity of all processes, social as well as natural.

This model finds a series of indications in the idea of the 'ecological' community and the 'environment-school' (an environment in tight continuity with the environment-planet). It is at such schools where one can, one must (by making them laboratories for research and concrete applications) try to 'be well' in terms of human relationships, where there is no discord between stated values and acted-upon values, where one learns to develop the knowledge and the skills to be a participant in a changing world, where one discusses and shares values about taking care of others and the Earth, where one reasons in terms of the future.

Sense of Place and Citizenship

The next step was to extend the view to the territory. In my opinion, the key concept to follow here is that the environment must be perceived and experienced, known and protected, in all of its aspects, without distinctions between nature and culture or between 'high' culture and 'material' culture, and by starting from one's own 'surroundings'. The pursuit and the recognition of one's roots concerns everyone and is posed in terms of new challenges in a world affected by strong and rapid changes due to migration, to the galloping invasion of every residual space, to global warming, etc.

The sense of place needs to be rediscovered and reconstructed in ways that are not xenophobic or bitterly 'parochial', both by the native inhabitants of a territory, assailed by globalisation and exposed to the standardisation of mass culture, and by the migrants, who must become active and responsible citizens of the new communities they have become a part of through precise policies of reception and intercultural exchange.

Moreover, since more and more territories are being assailed by the movement of tourists, which has a very serious social and environmental impact, we need to encourage an ecological approach to travel, a different and more relaxed relation with time, an integrated interpretation of the landscape, an education for respecting the territory that appeals to the idea of beauty, the collective care of shared assets, the relationships among citizens based on participation, sharing, solidarity.

International Breadth

In addition, very soon my collaborators and I looked further afield for collaborations in Europe, the Mediterranean and the rest of the world. We created networks, organised congresses and cross-border and international projects.

We have seen, and with the World Environmental Education Congress network have brought to the attention of everyone, how environmental education changes language and topics from place to place to adapt to the various contexts. The greater the distance, the more environmental education changes (the wealth of the thousand 'environmental educations' in the world is one of the things we have learned from the WEEC congresses) – even though there is a shared vision and fundamental mission and the reciprocal enrichment of having a network of methodologies, reflections, best practices.

The complexity of the phenomena of the inextricable culture–nature, human society–environment *continuum* urges us to accept the uncertainty and interdependence of the human condition, the limitations, the impossibility of dominating nature, and thus to appreciate lifestyles that, in addition to reducing humankind's ecological footprint, can also restore values like the re-enchantment of the world, reciprocity, silence, slow movement, rest...

Work and Knowledge

Environmental education – as expressed in my university teaching and the way I feel it is becoming established in the world, at least in its more advanced formulations – offers catastrophism the hope of a necessarily gradual, yet urgent and effective transition. Thanks in part to the cross-cutting nature of environmental education, diverse analytical doctrines must go beyond the disciplinary barriers that separate them; the dichotomy between declared 'high' ideals and narrow-minded models affecting concrete choices must be reduced; wiser approaches to the problems of the contemporary world must be established through knowledge.

In this way, work and the economy should become increasingly in line with the environment thanks to eco-design, the re-designing of the entire life cycle of products, the birth of bio-regional economic systems, etc. And this could offer workers, designers and entrepreneurs new

opportunities, new personal satisfactions, and new ethical legitimacies.

The formation of theoretical and practical, relational and organisational skills is, in fact, the primary tool of an ecological revolution of the socio-economic system.

Communicating the Environment

The numerous courses, seminars and publications I have actively participated in these years trained hundreds of trainers. My story has therefore also been a story of involvement in communication, in what is called 'informal' education, by contributing – I hope – to 'educating' thousands of people also by way of the magazine '*.eco*', its web site www.educazionesostenibile.it and the other related tools (including 'Il Pianeta Azzurro', a specific project dedicated to the world of fresh water and salt water). The story of '*.eco*' is absolutely unique in Italy because of its continuity, the breadth of the topics it deals with, the number of authors and interviewees involved and the fact that it is a monthly magazine.

However, as long and as culturally and scientifically important as it is, the story of '*.eco*' is only a small part of the system of communication. The role of mass communication, and now that of the 'new medias', is a theme that research in environmental education must examine more closely, both to understand and 'dismantle' the inauspicious influence of mass media and advertising on the collective imagination and on lifestyles, and for all of us to learn to communicate in a more effective, original and 'ecologically correct' way.

The Importance of the Network

Communicating also means being in contact. The word 'communicate' comes from the Latin 'cum' plus 'munus': 'carrying out a task together'. Together we must give each other strength. Together we must carry out the task of contributing to cultural change and thus to a socio-economic transformation and to eco-development. Although there are encouraging signs of becoming more aware, the need for a 180° turnabout has still not been sufficiently understood.

A Final Note …

When I was a young boy (I live in a large industrial city, and back then a thick layer of coal dust used to cover the windowsills) I would wonder how the earth could keep from suffocating, covered as it was by a shroud of asphalt.

Today all of us, human beings and bacteria, butterflies and blades of grass, are suffocating under the plague caused by humanity. And I ask myself how we can fail to hear the suffering cry and how we can delude ourselves into thinking that we can consume everything – space and lives, resources and the future – without deposit and without precaution.

Notes on the Contributor

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Endnote

1 G7 is the Group of Seven (seven industrialised nations of the world). OECD is the Organisation for Economic Co-operation and Development

Think Piece
From the Push of Fear, to the Pull of Hope: Learning by design

Stephen Sterling, University of Plymouth, UK

One of the benefits of getting older is gaining an overview of things. Over time, you obtain a clearer standpoint from which to view trends, patterns and changes. All too quickly, you also find yourself changing, from a young advocate, passionate about environmental education and keen to learn, to one of the old guard, still committed but possibly a bit wiser about the possibilities of and barriers to change.

In my study at home, and immediately visible from my desk, are shelves full of reports, books, manuals which I've collected over a 30-year period. I ought to throw away – sorry, recycle – more than I do, but I've always been a bit of an archivist. It's fascinating to look back at what we were saying 10, 20, 30 and more years ago. And I wonder how much has really changed, and how deeply we are imbued with and seduced by the Western idea of intellectual progress, so that 'old ideas' must by their nature, be less relevant, less insightful than 'new ideas'.

One of the books on my shelf I sometimes to refer to when I'm giving talks is called *Teaching for Survival – A Handbook for Environmental Education* by Mark Terry. It's worth quoting the blurb on the very first page: 'ALL EDUCATION IS ENVIRONMENTAL EDUCATION' it shouts in capitals, and then,

> The pleas for development of environmental education as a new subject have misrepresented the problem, which is to change the environmental education that is provided in the study of any subject and in any classroom according to our best understanding of environmental realities. We must realise that all educational situations contribute to environmental education.

The blurb continues, and Terry 'presents a way to change in the classroom the basic assumptions of our educational system – assumptions which ultimately lead to the destruction of our natural environment'. Here are two radical ideas which are as relevant now, as they were when I found this book – in a London bookshop back in 1971. That's not far off 40 years ago.

Clearly, an awful lot has changed in our approach to environmental and sustainability education in this time, and we, as a movement, have learnt a great deal. Whilst celebrating this and taking things forward, it's helpful to look back too, and rediscover and value some perennial insights, such as those which Terry and many others have presented over the years. In this spirit, I've also recently revisited Barry Commoner's 'Four Laws of Ecology' which also date from 1971 and are worth re-stating here: 'Everything is related to everything else'; 'Everything must go somewhere'; 'Nature knows best' and 'There is no such thing as a free lunch'. Would that

policy makers had informed their decision making by such simple but profound principles in the period since. Now let's jump to the Tbilisi Declaration.

By 1978, I had stopped classroom teaching and began working with the Council for Environmental Education in the UK – the year after the UN Tbilisi conference. I was happy to be in the wake of that event, enthused by the fact that it had taken place – an intergovernmental conference: surely, the stage was set for great things. It is testimony to the writers of the Declaration that the report was in fact seen as seminal by virtually everybody in the environmental education movement. It was not just the fact that they felt mandated, but the text and rhetoric was visionary and meaningful – more accessible and practicable than most UN-speak. The Declaration reflected a prescient holistic outlook, with its emphasis on social inclusion and participation, on interdisciplinarity, lifelong learning, and local-global perspectives.

Where the Declaration fell short, and this applies to virtually all the high-level documents since which deal with environmental and sustainability education, is with regard to any critique of existing educational systems. Rather, the Declaration states that in order to achieve the goals of environmental education, a number of specific actions are required to 'fill the gaps' which 'continue to exist in our present education system' (UNESCO-UNEP, 1978, cited in Barry, 1992) – which presumably was fine in all other respects. The UN system cannot radically critique existing systems, except by implication, because of political constraints.

Thirty years later, the environmental and sustainability movement, with a few exceptions, is still not good at critiquing the context it seeks to influence. We can design wonderful new programmes, courses, curriculum materials, strategies and so on, but unless we delve deeper into the assumptions and values (as Terry suggested) that shape mainstream existing policy and provision both in education and wider society, we will always find our work constrained and marginalised. Whilst sustainability issues become evermore acute, most education globally still makes little or no reference to these issues.

As a young man, fired by Terry's book – and by Rachel Carson, Paul Ehrlich, E.F. Schumacher, Barbara Ward, and the Meadows' *Limits to Growth*, amongst others – and feeling mandated by the 1972 Stockholm 'UN Conference on the Human Environment' which pointed to education as a key to addressing environmental issues, I was pretty optimistic, and perhaps naïve, that humanity would change course once environmental education had highlighted the mounting dangers we were collectively creating.

Except it didn't quite happen of course. Twenty-five years of involvement and observation later, I grappled with the key question informing my doctoral inquiry: why is education as a whole, and environmental and sustainability education in particular, limited in their ability to make a positive difference to the human or environmental prospect by helping assure a more sustainable future – and what bases and qualities of change might lead them to become more transformative in this regard? It's still a huge and challenging question.

With regard to the latter part, (and assuming you were interested), I'll save you reading the 100 000+ words of my doctoral answer (Sterling, 2003), by summing it up in three: whole systems thinking. Looking back, I've made a career (of sorts) out of one thing: trying, and helping others also, to discover what holistic thinking really means and implies. This seems to

me to be an imperative to help heal a fragmented, endangered and fearful world built partly on what Gregory Bateson (another of my influences) called our 'epistemological error', by which he meant the perception of and belief in separateness that pervades the Western (and Westernised) consciousness. Over 30 years ago, Bateson wrote, 'I believe that (the) massive aggregation of threats to man and his ecological systems arises out of errors in our habits of thought at deep and partly unconscious levels' (1972:463). When I'm teaching, I sometimes ask students to look out and tell me where the environment stops and starts, and where society stops and starts, and where the boundaries of the economy lie. They can't be seen of course, yet we persist in projecting a fragmented perception onto a whole and interpenetrating reality.

If we want to educate for the whole person, for a genuinely more sustainable society, for a liveable and healthy future, we need to recognise the deep habits of thought in our individual and collective psyche, that tend to work against this direction, not least through their influence on mainstream educational purposes, policies and practice. Over the years, I've developed a three-part model that reflects the three 'seeing, knowing and doing' dimensions of personal and collective worldview. These are *perception* (or the affective dimension), *conception* (or the cognitive dimension), and *practice* (or the intentional dimension). In the first dimension, objectivism and individualism are often dominant, in the second we manifest a reductionist and dualistic tendency, in the third our practices are often disintegrative and lacking contextual or relational concern and thought. If we can recognise and examine these three interrelating aspects of worldview or paradigm, and also see them informed by a still powerful mechanistic metaphor underpinning our perception of the world, and assisted by growthist values, we can begin both to achieve a critical 'stepping out' or second-order learning, and a vantage point from which we can see and begin to articulate a relational constructive postmodern worldview, that is more adequate, appropriate and necessary for our times.

Referred to variously as 'ecological', 'living systems' and 'participative', this emergent and broad worldview transcends our dysfunctional view of the world and of each other, in Thomas Berry's words, as 'a collection of objects' with an understanding that we, and non-human species, are a highly interconnected 'community of subjects' (Berry, 2000). It entails a shift of emphasis from relationships largely based on separation, control, manipulation and excessive competition towards those based on participation, appreciation, self-organisation, mutuality, equity and justice. I term this 'whole systems thinking', an evolution of thinking and being such that the three dimensions of worldview are expanded and transformed, involving a necessary conjoining between an ecological ethics and sensibility, a connective or systemic understanding, and an integrative and sustainable way of interacting in the world and with each other. In short, this worldview transcends the alienating objectivism of modernism, and the disabling relativism of postmodern deconstructionism, and suggests a contextual relationalism. It involves developing a collective and connective consciousness which is *holistic*, 'How does this relate to that?', 'What is the larger context here?'; *critical*, 'Why are things this way, in whose interests?'; *appreciative*, 'What's good, and what works here?'; *participative*, 'Who is being heard, listened to and engaged?'; *systemic*, 'What are or might be the consequences of this?'; *creative*, 'What innovation might be required?'; and *ethical*, 'How should this relate to that?', 'What is wise action?', 'How can we work towards the inclusive wellbeing of the whole system?'.

This holistic three-part model of paradigm change manifests in various ways. In academic language, it can be seen in terms of *epistemology*, *ontology* and *methodology*. In traditional educational terms, it represents the *heart, head* and *hands* of the individual learner. In everyday terms, it underlines *awareness*, *understanding* and *competence*, and it points to the learner who is at once *concerned*, *connected* and *capable*. In strategic terms, it represents developing *vision*, *critique* and *design* for change. In educational terms, it represents *paradigm and purpose*, *policy and curriculum*, and *pedagogy and practice*.

This model is one attempt to help us go a step beyond mounting calls to 'change our way of thinking and doing' (which have been with us before and since Tbilisi) to uncover the roots of why we are as we are, and, from this basis, clarify the nature of a shift of collective consciousness which is already underway, in order to accelerate it further. The Great Transition Initiative's study of future scenarios suggests that 'the momentum toward an unsustainable future, can be reversed but only with great difficulty … (and yet) … a planetary transition toward a humane, just and ecological future is possible' (Raskin *et al.*, 2002:95). This depends crucially on 'the reflexivity of human consciousness – the capacity to think critically about why we think what we do – and then to think and act differently' (Raskin, 2006:23). From this perspective, the learning society is one that seeks to understand, transcend and re-direct itself through *intentional learning*. According to a Worldwatch report, we need to become conscious agents of our own cultural evolution in order to create a sustainable civilisation (Gardner, 2001:206): a huge social learning challenge, which, according to the writer Mary Clark, has only been achieved twice before in human history (see Sterling, 2007).

One thing that environmental educators have learnt over the years is that information alone is not the key. The authors of reports from IPCC, WWF, UNESCO, UNDP, UNEP, the Worldwatch Institute and so on must sometimes wonder what they need to say to get a sufficient reaction from policy makers and the public. While a sense of crisis can sometimes lead to breakthrough and new patterns of thinking and behaviour, it can also have just the opposite effect. Constant and mounting bad news can lead to numbing, denial, and retrenchment, or if it is believed and accepted, disempowerment and despondency. This is what I call 'learning by default' – it's 'late in the day' and reactive. Intentional learning is different, and may be called 'learning by design'. Such learning is both preventive and remedial, both anticipative and rooted in current needs and realities. It combines critique and creativity with foresight and wisdom. It is at least second-order learning (challenging dominant assumptions) and sometimes third-order (seeing differently through changed paradigms). It is essentially about taking the 'cultural volatility' that the current sense of crisis engenders, and turning its energy to positive, constructive learning towards more intelligent and sustainable living. This reflects what the Global Transition Initiative has labelled the 'push of fear' and the 'pull of hope' (Raskin, 2006).

So environmental and sustainability educators have a daunting but positive responsibility: to help seed a change in consciousness, to facilitate learning by design, to develop anticipative education, to nurture and mentor resilient learners, and develop critical learning environments where transformative, experiential and experimental learning can take place, at personal, institutional and social levels. And to do it in a spirit of hope and collaborative inquiry. The shape of the future, whether liveable or dystopian or somewhere between, will be determined

by how deeply we as a species are able to respond to the sustainability challenges that face us in the pivotal decades ahead. This is an unprecedented learning challenge, involving unlearning, re-learning and new learning to assure ecological integrity, social coherence, and economic viability as mutually interdependent conditions.

The Global Transition Initiative notes that an emerging planetary consciousness, identity and citizenship may seem improbable, but given 'the push of fear' – the increasing realisation that we might share a common downward destiny – and the 'pull of hope', a positive planetary vision, it is certainly possible. Learning by design is key to increasing that possibility.

Notes on the Contributor

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Think Piece
Learning in a Changing World and Changing in a Learning World: Reflexively fumbling towards sustainability

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Introduction

We need nothing short of a new global ethic – an ethic which espouses attitudes and behaviour for individuals and societies which are consonant with humanity's place within the biosphere; which recognises and sensitively responds to the complex and ever-changing relationships between humanity and nature and between people. Significant changes must occur in all of the world's nations to assure the kind of rational development which will be guided by this new global ideal – changes which will be directed towards an equitable distribution of the world's resources and more fairly satisfy the needs of all peoples. This kind of development will also require the maximum reduction in harmful effects on the environment, the utilisation of waste materials for productive purposes, and the design of technologies which will enable such objectives to be achieved. Above all, it will demand the assurance of perpetual peace through coexistence and cooperation among nations with different social systems.

Policies aimed at maximising economic output without regard to its consequences on society and on the resources available for improving the quality of life must be questioned. Before this changing of priorities can be achieved, millions of individuals will themselves need to adjust their own priorities and assume a personal and individualised global ethic – and reflect in all of their behaviour a commitment to the improvement of the quality of the environment and of life for the world's people.

The reform of educational processes and systems is central to the building of this new development ethic and world economic order. Governments and policy makers can order changes, and new development approaches can begin to improve the world's condition – but all of these are no more than short-term solutions, unless the youth of the world receives a new kind of education. This requires new and productive relationships between students and teachers, between schools and communities, and between the education system and society at large.

A basic aim of sustainability education is to succeed in making individuals and communities understand the complex nature of the natural and the built environments resulting from the interaction of their biological, physical, social, economic and cultural aspects, and acquire the knowledge, values, attitudes and practical skills to participate in a responsible and effective way in anticipating and solving sustainability problems, and in the management of the quality of the environment. A further basic aim of sustainability education is clearly to show the economic, political and ecological interdependence of the modern world, in which decisions

and actions by different countries can have international repercussions. Sustainability education has a role to play in developing a sense of responsibility and solidarity among countries and regions as the foundation for a new international order which will guarantee the conservation and improvement of the environment. For this purpose, sustainability education provides the necessary knowledge for interpretation of the complex phenomena that shape the environment, and encourages those ethical, economic and aesthetic values which, constituting the basis of self-discipline, will further the development of conduct compatible with the preservation and improvement of the environment. To carry out these tasks, sustainability education should bring about a closer link between educational processes and real life, building its activities around the sustainability problems that are faced by particular communities and focusing analysis on these by means of an interdisciplinary, comprehensive approach which will permit a proper understanding of sustainability problems.

Before reading on, please take a few minutes to reflect on what you have just read. Does it make sense to you? Are you sympathetic to the analysis of our 'current' state of affairs and to the aims of sustainability education provided?

What you have read so far is not something that I have written. Some of you may have recognised a few lines here and there as all of the above is a mixture of sentences almost literally taken from the 1975 Belgrade Charter (UNESCO, 1975) and the 1977 Tbilisi Declaration (UNESCO-UNEP, 1978). I have made a selection from both landmark documents and have 'only' changed three things: (1) environmental education has been changed into sustainability education, (2) environmental problems have been changed into sustainability problems, and (3) the declarative and prescriptive 'should', typical of international declarations, has been eliminated. Some of you, probably most of you, will be surprised that these texts were generated over 30 years ago when nobody spoke of 'sustainable development' and certainly nobody used the phrase 'education for sustainable development'. One can ask the question why these words, signed by so many governments back in the seventies, have had so little impact? In fact one could argue that we are now in the midst of the crisis that was already announced by some in the fifties and sixties of the last century.

I have brought back these landmark sentences to ask the question: what have we learned in over 30 years? Are there any new insights in 'our' field? What kinds of innovations in 'learning' have entered 'our' field (regardless of whether you call this field environmental education (EE), education for sustainable development (ESD), education for sustainability (EfS), sustainability education (SE), learning for sustainability (LfS), or something else)? Are we learning at all in this changing world? This paper links the theme of 'Learning in a changing world' to the idea of 'Changing in a learning world' to highlight the need for reflexive responsiveness and the creation of learning societies in moving towards a world that is more sustainable than the one currently in prospect. At the same time, the theme-expansion stresses that in order to adequately deal with this changing world we ourselves need to be changing. The paper draws from a book I recently was privileged to edit titled *Social Learning towards a Sustainable World,* which brings together scholars and practitioners from around the world exploring ways to utilise diversity, dissonance and emergence in creating communities of learners who creatively work towards a more resilient and responsive system (Wals, 2007).

Conceptualising Sustainability Challenges

The nature of sustainability challenges seems to be such that a routine problem-solving approach falls short as transitions towards a more sustainable world require more than attempts to reduce the world around us into manageable and solvable problems. Instead, such transitions require a more systemic and reflexive way of thinking and acting with the realisation that our world is one of continuous change and ever-present uncertainty. This alternative kind of thinking suggests that we cannot think about sustainability in terms of problems that are out there to be solved or in terms of 'inconvenient truths' that need to be addressed, but we need to think in terms of challenges to be taken on in the full realisation that as soon as we appear to have met the challenge, things will have changed and the horizon will have shifted once again.

After 20 years or so of talk about sustainability and sustainable development, both in theory and in practice, it has become clear that there is no single outlook on what sustainability or sustainable development means. It is also clear that there is not one process that will confidently realise its achievement. Determining the meaning of sustainability is a process involving all kinds of stakeholders in many contexts, people who may not agree with one another. There are different levels of self-determination, responsibility, power and autonomy which people can exercise while engaged in issues or even disputes related to sustainability. In dealing with conflicts about how to organise, consume and produce in responsible ways, learning does not take place in a vacuum but rather in rich social contexts with innumerable vantage points, interests, values, power positions, beliefs, existential needs, and inequities (Wals & Jickling, 2002; Wals & Heymann, 2004). The amount of space individuals have for making their own choices for developing possibilities to act, and for taking responsibility for their actions, varies tremendously. Hence, creating a world that is more sustainable than the one currently in prospect, might have something to do with the utilisation of diversity, the creation of space for learning and innovation, and overcoming inequities and power imbalances that limit certain peoples' possibilities to participate.

Learning Systems

Fritjof Capra sees ecosystems as learning systems that have developed a number of traits that he considers both crucial and exemplary for social systems, including resilience, flexibility, and adaptive and networked connectivity (Capra, 1994; 1996; 2007). All these traits combined lead to sustainability and continuity. The essence of sustainability, Capra maintains, lies in the way ecosystems are organised and are able to respond to disturbances/crises. Healthy (eco) systems are systems that are continuously learning. Fritjof Capra suggests that creating a more sustainable world requires that we have a better look at how ecosystems work and become competent systems thinkers. Systems thinking here broadly refers to things like: seeing connections and interrelationships, fine-tuning functions and roles, utilising diversity, and creating synergies (see also Sterling, 2004; Tilbury, 2007). Social learning is often referred to as a way of organising individuals, organisations, communities and networks, that is particularly fruitful in creating a more reflexive, resilient, flexible, adaptive and, indeed, ultimately, more sustainable world (Keen,

Brown & Dyball, 2005; Wals, 2007). The adjective 'reflexive' has been added here to stress the important, but underused, human ability that has been identified by a number of scholars as a key aspect of (transformative) (system) learning (Dyball, Brown & Keen, 2007; Loeber, van Mierlo, Grin & Leeuwis, 2007; McKenzie, 2007; O'Donoghue, Lotz-Sisitka, Asafo-Adjei, Kota & Hanisi, 2007). A learning system has to be reflexive in order to be willing and able to question (and break away from) existing routines, norms, values and interests. A reflexive society requires reflexive citizens able to participate in and contribute to processes of change.

David Selby – in applying a Bohmian perspective on, what he calls, dialogical social learning – suggests that participants in such a reflexive system would individually and collectively need to commit to a range of things (Selby, 2007:171–172):

- Empathetic and alert listening in which each listener would make conscious efforts to be mindful of their refractive thought processes whereby others' ideas are selected, prioritized, aggrandized or belittled according to the degree of fit with the receiver's own *Weltanschauung*, participants being prepared to own to and discuss their listening difficulties in this regard;
- Attentiveness to their own emotional and somatic responses to the interventions of others and readiness to share and explore those reactions, inviting the reflections and insights of others;
- Pooling perceptions of what they construe to be the misperceptions on the part of others of their own – and others' – interventions;
- Suspending assumptions and opinions in the sense of suspending them in front of the group; that is, flagging them to participants, neither suppressing them nor allowing them to inhibit participation in an emergent pool of common meaning;
- Abandoning the 'impulse of necessity,' the assumption that something is so absolutely necessary that there cannot be any yielding on the issue, and, hence, being prepared for 'new orders of necessity,' however provisional, to emerge from the flow of dialogue (Bohm 1996, 21–3);
- Engaging in open, transparent and mutual collaboration in applying proprioception to thought, bringing into conscious awareness, and thereby seeking to dissolve, conditioned fragmentation in its intellectual, psychological, emotional and somatic manifestations;
- Bringing what is tacit (implicate) in individual responses, what is vaguely felt and normally not articulated, out into the open within the dialogical process and exploring whether and to what extent its articulation resonates across the group.

Social Learning

Social learning is not introduced here just as a naturally occurring phenomenon but also as a way of organising learning and communities of learners. This is not to suggest that there is some kind of consensus about the meaning of social learning. As Parson and Clark (1995:429) write:

> The term social learning conceals great diversity. That many researchers describe the phenomena they are examining as 'social learning' does not necessarily indicate a common theoretical perspective, disciplinary heritage, or even language. Rather, the contributions employ the language, concepts, and research methods of a half-dozen major disciplines; they focus on individuals, groups, formal organizations, professional communities, or entire societies; they use different definitions of learning, of what it means for learning to be 'social,' and of theory. The deepest difference is that for some, social learning, means learning by individuals that takes place in social settings and/or is socially conditioned; for others it means learning by social aggregates.

One could argue that idea of social learning is attractively vague still. Nonetheless it is safe to say that social learning tends to refer to learning that takes place when divergent interests, norms, values and constructions of reality meet in an environment that is conducive to meaningful interaction. As suggested earlier, this learning can take place at multiple levels, i.e., at the level of the individual, at the level of a group or organisation, or at the level of networks of actors and stakeholders. In their book on environmental management, Keen *et al.* (2005) describe social learning as '… the collective action and reflection that occurs among different individuals and groups as they work to improve the management of human and environmental interrelations' (p.4). In the context of sustainable environmental management they speak of five braided strands of social learning: reflection, system orientation, integration, negotiation and participation.

From the idea of 'sustainability as emergence' (Bawden, 2004), moving towards sustainability as a social learning *process* is more interesting than sustainability as an expert predetermined transferable *product* (i.e., as set by a policy, code of behaviour, charter or standard) (Jickling & Wals, in press). Through facilitated social learning, knowledge, values and action competence can develop in harmony to increase an individual's, a group's or a network's possibilities to participate more fully and effectively in the resolution of emerging personal, organisational and/or societal issues. In social learning, the learning goals are, at least in part, internally determined by the community of learners itself.

The point of social learning is perhaps not so much what people should know, do or be able to do, which could be an embodiment of authoritative thinking and prescriptive management, but rather: How do people learn? What do they want to know and learn? How will they be able to recognise, evaluate and, when needed, potentially transcend or break with existing social norms, group thinking and personal biases? What knowledge, skills and competencies are needed to cope with new natural, social, political and economic conditions, and to give shape and meaning to their own lives? How can social learning build upon people's own knowledge, skills and, often alternative, ways of looking at the world? How can the dissonance created by introducing new knowledge, alternative values and ways of looking at the world become a stimulating force for learning, creativity and change? How can people become more sensitive to alternative ways of knowing, valuing and doing, and learn from them? How do we create spaces or environments that are conducive to this kind of learning?

These questions not only suggest that learning in the context of sustainability is open-ended and transformative, but also that it is rooted in the lifeworlds of people and the encounters they have with each one another. It is these 'encounters' that provide possibilities or opportunities for meaningful learning as they can – however, not automatically – lead both to (constructive) dissonance and increased social cohesion. The value of 'difference' and 'diversity' in energising people, creating dissonance and unleashing creativity has been repeatedly mentioned by several scholars who have reflected on the meaning of social learning in the context of sustainability (Wals, 2007). Many also speak of the power of 'social cohesion' and 'social capital' in creating change, and building resilience, in complex situations characterised by varying degrees of uncertainty. In addition to the importance of social cohesion, diversity and dissonance, the power of collaborative action that preserves the (unique) qualities of each individual is mentioned by a number of scholars (i.e., Apple, 2007; Bradbury, 2007; Glasser, 2007).

The success of social learning depends a great deal on the collective goals and/or visions shared by those engaged in the process. Whether such collective goals and/or visions can actually be achieved depends, to a degree, on the amount of space for possible conflicts, oppositions and contradictions. In social learning the conflicts and their underlying sources need to be explicated rather than concealed. By explicating and deconstructing the oftentimes diverging norms, values, interests and constructions of reality people bring to a sustainability challenge, it not only becomes possible to analyse and understand their roots and their persistence, but also to begin a collaborative change process in which shared meanings and joint actions emerge.

Conflict and Dissonance, Framing and Reframing

Given the importance of conflict and dissonance in social learning, it is important to be mindful of people's comfort zones or dissonance thresholds. Some people are quite comfortable with dissonance and are challenged and energised by radically different views, while others have a much lower tolerance with regard to ideas conflicting with their own. The trick is to learn on the edge of people's individual comfort zones with regard to dissonance: if the process takes place too far outside of this zone, dissonance will not be constructive and will block learning. However, if the process takes place well within people's comfort zones – as is the case when homogeneous groups of like-minded people come together – learning is likely to be blocked as well. Put simply: there is no learning without dissonance, and there is no learning with too much dissonance! Ideally, facilitators of social learning become skilful in reading people's comfort zones, and when needed, expanding them little by little. An important role of facilitators of social learning is to create space for alternative views that lead to the various levels of dissonance needed to trigger learning both at the individual and at the collective level.

Frame awareness, frame deconstruction and reframing (Kaufman & Smith, 1999) can be viewed as central steps in transformative social learning. People can become so stuck in their own frames – ideas, ways of seeing things, ways of looking at the world, ways of interpreting reality – that they may fail to see how those frames colour their judgement and interaction. Perhaps the essence and success of social learning lies in people's ability to transcend their individual frames, so that they can reach a plane where they are able find each other and create enough 'chemistry'

to feel empowered to work jointly on the challenges they come to share. An important first step in social learning is becoming aware of one's own frames. Only then can deconstruction (sometimes referred to as de-framing) begin (Wals & Heymann, 2004). Deconstruction is then seen as a process of untangling relationships, becoming aware of one's own hidden assumptions, their ideological underpinnings and the resulting blinding insights they provide. When this is done in a collaborative setting, where dissonance is properly managed, cultivated and utilised, participants become exposed to the deconstructed frames of others, begin to rethink their old ideas and are challenged to jointly create new ones (co-creation).

It is hard to capture social learning in a neat process or cycle, but there are some 'sequential moments' or activities that might be helpful when trying to design and monitor social learning (see also Wals & Heymann, 2004):

- Orientation and exploration – identifying key actors and, with them, key issues of concern or key challenges to address in a way that connects with their own prior experiences and background, thereby increasing their motivation and sense of purpose
- (Self)awareness raising – eliciting one's own frames relevant to the issues or challenges identified
- Deframing or deconstructing – articulating and challenging one's own and each other's frames through a process of clarification and exposure to conflicting or alternative frames
- Co-creating – joint (re)constructing of ideas, prompted by the discomfort with one's own deconstructed frames and inspired by alternative ideas provided by others
- Applying/experimenting – translating emergent ideas into collaborative actions based on the newly co-created frames, and testing them in an attempt to meet the challenges identified
- Reviewing – assessing the degree to which the self-determined issues or challenges have been addressed, but also a review of the changes that have occurred in the way the issues/challenges were originally framed, through a reflective and evaluative process

A preliminary phase is likely to be needed before entering this cycle of activities. In this phase the initiators of the change process reflect on the nature of the change process by asking questions such as: 'Is the kind of change that is desired of a more emancipatory or of a more instrumental nature?' and, 'Is there sufficient political and organisational space available for engaging people in a participatory process characterised by high levels of self-determination and autonomy?'. These questions need to be asked in order to be able to confidently introduce and enhance social learning as a vehicle for realising change.

It should be noted that although these activities can be distinguished, they are hard to separate in reality as they interrelate and overlap. They also suggest a linearity one seldom finds in social learning processes since social learning is more of an ongoing, cyclical and emergent process. Furthermore, having an evaluation moment at the end suggests that this is a one-off activity which it obviously should not and need not be: social learning requires reflection and reflexivity throughout the entire process, if only to improve the quality of the process itself and to monitor change and progress throughout. Interestingly enough the sequence of activities as presented here resembles the conceptual change process as described by Driver and Oldham (1986) in the context of children's learning in science.

But What about Sustainability?

People around the world, scientists and policy makers alike, are working on identifying 'indicators of sustainable development' (130 000 Google hits on March 8, 2007) or 'sustainability indicators' (393 000 Google hits on March 8, 2007). Many scientists working on sustainability are doing so at the request of international organisations like UNESCO, UNECE, UNEP and the World Bank, or at the request of national governments. Sustainability and sustainable development – but also 'education for sustainable development' (500 100 Google hits on March 8, 2007) as a means to 'realise' sustainability – have deeply penetrated the world of policy. There is quite some pressure to translate these policies into concrete actions with measurable outcomes, by creating benchmarks and standards that heavily rely on Specific, Measurable, Acceptable, Realistic, Time-specified (SMART) goals. To have an exhaustive list of sustainability indicators seems very handy for becoming SMART in working towards a more sustainable world, but at the same time might take the learning out of moving towards a more sustainable world, and, therefore, ironically perhaps, block any progress towards such a world.

This is not to say that having indicators for sustainability is necessarily a bad thing, but the questions then become: For whom are these indicators? How have they been created? By whom? Are they carved in stone or subject to change and even abolition? The process of identifying indicators can in and by itself be a very useful part of social learning, but when indicators are then authoritatively generated and prescribed, the transformative learning disappears and is replaced by the kind of conditioning and training that might be damaging in creating a more reflexive, empowered, critical, self-determined citizenry that competently and creatively co-designs a more sustainable world.

Interestingly enough *none* of the 27 contributions to *Social Learning towards a Sustainable World* (Wals, 2007) focus on sustainability as a measurable outcome. Instead they focus on the *processes* and the *conditions* needed to *engage* people in issues related to sustainability. Most of them, however, will probably agree that our current way of living on this planet is unsustainable and something needs to, indeed, radically change in the way we live, interact, do business, use resources, and so on. They suggest – some more explicitly than others – that it would be pretentious to declare what 'sustainability' is exactly, let alone how it should be implemented. In fact, they suggest that doing so would take the learning out of creating a more sustainable world, whereas, in their view, the key to creating a more sustainable world lies precisely in *learning*. More specifically: not just in any learning, but rather in transformative learning that leads to a new kind of thinking, alternative values and co-created, creative solutions, co-owned by more reflexive citizens, living in a more reflexive and resilient society.

Back to Belgrade

A lot has changed since Belgrade in 1975. We only have to look at (former) Yugoslavia and the Balkan region today to be convinced of that. Why then has so little changed in environmental education since the Belgrade Charter and the Tbilisi Declaration? Today's policy statements about ESD highly resemble the international declarations on EE of the mid-seventies. Some

of the wording has changed perhaps, but there is still little evidence to show that EE or ESD and ESD-derivatives, for that matter, plays a key role in creating a more reflexive society that is able to critique and overturn existing routines, values, norms and interests which we (can) know or intuitively feel are deeply unsustainable. As the looming eco-cultural crises, that were already so well articulated in the mid-seventies of the last century, are becoming more visible, more transparent and more complex, and at the same time, more urgent and, indeed, more real, it is more tempting than ever to become SMART, prescriptive and instrumental in finding solutions. Yet, environmental education (EE), education for sustainable development (ESD), education for sustainability (EfS), learning for sustainability (LfS), and sustainability education (SE), should (with apologies) resist this temptation and dare to focus on (critical) reflexivity and transformative (social) learning as a means to engage people meaningfully in the everyday struggle for a better world.

Sustainable living requires more than consensus in the present about what sustainability is or even might be. While there is a constellation of ideas as to what a sustainable world might entail, the lack of consensus about the implications of an exact meaning – if this were at all possible – in variable contexts, should prevent global prescriptions. Instead contextual solutions are required that are, at least partly, co-created and co-owned by those who are to (want to?) live sustainably. Forcing consensus on how people should live their lives is undesirable from a deep democracy perspective, and from an emancipatory education perspective it is essentially 'mis-educative' (Dewey, 1916; Wals & Jickling, 2002).

Social learning – albeit as a spontaneously emerging property of people interacting together or as an intentionally introduced and facilitated process of change – not only allows for commonalities and social cohesion to form, it also provides space for disagreement and 'dissensus'. From this perspective, democracy and participation – much like social learning – depend on this space for difference, dissonance, conflict, and antagonism. This also suggests that in reflexively fumbling towards sustainability, deliberation is radically indeterminate (Goodman & Saltman, 2002). The conflicts that emerge in the exploration of sustainable living become prerequisites *for* rather than barriers *to* learning. Sustainable living requires dialogue to continuously shape and re-shape ever-changing situations and conditions. A dialogue here requires that stakeholders involved *can* and *want* to negotiate as *equals* in an *open* communication process which values *diversity* and *conflict* as driving forces for development and social learning. Hence, a key challenge for EE, ESD, EfS, LfS and SE lies in facilitating dialogical social learning that helps create a more reflexive society capable to respond adequately to emerging crises and challenges irrespective of their label.

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Think Piece
Exploring Relational Politics in Social Learning: Dilemmas of standing too close to the fire

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Introduction

> … a common theme amongst critics (of the dominant educational paradigm) is that problems with human-environment relationships (out there) are intimately linked to 'inner' problems, that is, our collective perception and thought processes are impeded by a lack of awareness of our 'in here' condition. (adapted from Sterling, 2003:118)

Sterling's (2003) concern was that, because paradigms/worldviews/cultures/discourses function as ideologies that legitimise/justify courses of action, we need to learn how each of us is complicit politically in constructing subtexts by which our actions are judged to be reasonable. Such learning is not neutral and is contingent on processes of participation that engage people in thoughtful social action. One could say, as many environmental educators have for several decades, that at the core of environmental education is a relational view of learning. A purpose of this paper is to explore how such a view of learning is tied intimately to a person's identity/subjectivity, that is, to explore how what happens 'out there' and 'in here' are mutually constitutive.

Recent incarnations of environmental education learning principles within forms of sustainability education, whilst flavoured to appeal to basic democratic values of justice and equity, continue to emphasise learning as action-oriented, community-based, participatory and perhaps even socially critical. As environmental educators know from experience, engaging such principles in school contexts can create tensions concerning fundamental educational processes. So, while environmental education can provide spaces for the articulation of different knowledge interests as socially acceptable forms of learning (i.e., educational experiences), resistances often occur when such practices extend educational responsibilities beyond traditional roles. How social movements for educational change are marginalised varies across jurisdictions but assessment devices and performance standards can work to silence innovation. Evaluation of student abilities in action-oriented field experiences, for example, situates evaluation outside conventional 'measures' of subject mastery or cognitive ability. In effect, a significant problem for implementation of environmental education or education for sustainable development has resulted from an hegemony of privilege of technical over practical ways of knowing and assessing at both institutional and teacher levels (see Moss, Girard & Haniford, 2006).

An epistemological/ontological distinction grounds the rhetoric-reality gap in environmental education/education for sustainable development (EE/ESD). Knowing what to do and how to do it can be viewed as a reflection of the interplay between teachers' personal practical theories (inside) and sociocultural contexts (outside). The idea that teachers have theoretical views that guide their practice (i.e., an interactionist view of theory/practice) permits some probing of those concepts, beliefs and assumptions in context. The epistemology is interactionist-relational: knowledge is what comes from interplay between teachers' subjective views and sociocultural contexts. Such an epistemological position implies a view of learning guided by social theory that recognises tensions and interconnections between lifeworld theories of social action (personal identity/agency) and systemic (i.e., social structures) aspects of people's experiences in the social world. Kemmis (1998) conceptualises this social matrix of lifeworlds in terms of meaning making (i.e., internalisation of values) and identity formation within knowing/learning as socially situated. His argument foregrounds the difficulty of securing any form of collective social identity/action within globalising social systems (e.g., steering media) designed to take the place of communities in regulating exchange and interaction. As a means to counter the power of such controlling discourses, he (re)asserts the value of local groups in constructing their own frames to explore the extent to which they can understand each other. He is not alone. Recent recastings of social theory represent attempts to find social understandings beyond the blindnesses of both objective realism and subjective relativism through interrelational processes that are grounded practically in critically reflexive sharing of personal practical theories.

Educational theorists have tended to neglect sociocultural theory that is influenced by wider cultural values. If educational theory is to emerge from its internecine disputes to address contemporary issues of major social significance, if ways of knowing/being can be conceived beyond universal prescriptive theories about 'what works' and 'what all teachers should do' then the focus on learning shifts to structures, practices and discourses that have contextual purchase. Learning is characterised as a complex process framed within individual and sociocultural discourses that reach into the micro-structure of both individual intellect and social interaction. Of central interest is to work out how relationships amongst learners' epistemic identities/subjectivities shape and are shaped by the epistemic milieux in which they find themselves (Claxton, 2002:27). This paper explores those spaces between personal identity and social dimensions of learning that are simultaneously 'deeply singular' and 'deeply social', as a basis for a pedagogy of environmental education that more actively engages relational and communicative competence and that values forms of social learning.

Exploring the Context of Social Dimensions of Learning as They Apply to EE/ESD

There seems little doubt in the minds of learning theorists of the need to explore relationships between culture and learning at many levels of social interaction (see Green & Luke, 2006). Putnam and Borko (2000) see this sociocultural shift in learning theory as more fundamental than the historical shift from behaviourist to cognitive learning theory (see Schuell, 1986). The research is replete with arguments that challenge assumptions about learning which

privilege individual cognition over more interactive and relational systems (see, for example, Brown, Collins & Duguid, 1989; Lave & Wenger, 1991; Greeno, Collins & Resnick, 1996; Greeno, 1997; Cobb & Bowers, 1999). The arguments are widely debated in the educational literature and as they apply to environmental education (see Hart, 2007; Reid, Jensen, Nikel & Simovska, 2007; Wals, 2007). The idea that interactions with people in one's environment are major determinants of both what is learned and how learning takes place recognises sociocultural in the learning process. The sociocentric view of knowledge holds that what we take as knowledge and how we think are the products of the interactions of groups of people over time (Soltis, 1981). These social groups act as discourse communities to provide cognitive tools (ideas, concepts, theories) that individuals appropriate to make sense of experiences. The process of learning in this sense is social – coming to know how to participate in the discourses and practices of particular communities (Resnick, 1991; Wertsch, 1991; Cobb, 1994). Beyond enculturation, the assumption is that, by participating, students will also learn to question and extend their own knowledge and thinking.

The implication for education is that schools must achieve better balance between the stress on individual competence and social competence to prepare students for successful participation in society (Resnick, 1987; Pea, 1993; Salomon & Perkins, 1998). Whilst the relative neglect of social learning in the academic literature now appears to have been corrected (Salomon & Perkins, 1998), this is not the case for educational practice (Ford & Forman, 2006) or environmental education (see Rickinson, 2001). Although environmental education (EE)/education for sustainable development (ESD) has always conceived of learning as a more balanced interrelationship of individual and social than has traditional schooling, there is a need to explore how social learning actually works through environmental education to contribute to the production of people more willing and able to participate in social/environmental action. This paper may be read as an interim report on my own face-to-face confrontation of this question of how social learning actually works.

A number of conceptual frameworks that conceptualise learning as an integration of social theories of action seem plausible. For example, theories of situated learning framed in the discursive paradigm (Foucault, 1972; Edwards & Potter, 1992; Harre & Gillett, 1995) and notions of distributed learning (Salomon, 1993) expand older behaviourist/cognitive psychological visions of learning in their epistemological/ontological foundations and in their views of how people come to associate themselves – that is, their 'self' – with thought and action. This paper attempts to go further, to explore how social learning works interactively to help individuals think and act socially/environmentally.

The idea that individual learning actually occurs within the context of participation in socially cultural practice is an epistemological claim with implications for educational practice. If learning can be conceived as a collective, participatory process of active knowledge construction emphasising context, interaction and situatedness, then it seems possible to imagine a moving inward of social functions to be internalised or appropriated as psychological (as well as sociological) functions. Participation, within 'activity systems' such as EE/ESD, involves both action and making sense in terms of the meanings (i.e., sustainability) it seeks to realise, the needs and motives it seeks to satisfy and the goals it seeks to achieve. Participation also implies

relational connection across boundaries/binaries of individual/environment in that each learns from the other in order to mutually constitute themselves (Tharp & Gallimore, 1988; Chaiklin & Lave, 1993; Cole, 1996; Wenger, 1998; Wertsch, 1998).

Exploring how concepts like sustainability survive and grow on the strength of the meanings invested in them, that is, in commitments based on personal meanings attached to actions taken on their behalf, seems to be a hinge-point in understanding thought and action that has its origins in our interests and emotions. Learning how to 'be' a participant in such explorations involves learning an action repertoire where social meanings can be investigated within participatory processes in relation to what that participation makes personally meaningful. This interplay between social and personal meaning is based on an epistemological understanding (i.e., social learning) that seems worthy as a starting point for clarifying how people come to act on their personal motives, that is, on how they can identify with 'what counts' within larger reference frames or globalising worldviews. This is the crucial point where personal identity/subjectivity and social learning can be seen as intricately connected. And this is the reason why educational research is turning its gaze toward subjectification (see the *British Journal of Sociology of Education, 27*(4), 2006).

The Socio-Spatial Imperative of Subjectivity/Identity in Learning in EE/ESD

As a dimension of learning, constructing identity – Probyn (2003) uses the term 'subjectivity' – involves conscious (re)examination of personal motives in terms of (or in critique of) social goals for education, sustainability and environment. Social involvement may make a person 'identifiable' with others (as well as to oneself) so that identity and actions mutually inform, rather than personally determine, what one actually is and does in sociocultural practices. Forming identity, as grounded in one's participation in socio/environmental practices, involves cognitive as well as affective dimensions (i.e., emotion, values) as registers of the quality of response to one's needs or motives. This integrated, complex and shifting postmodern notion of identity/subjectivity is temporal and spatial (i.e., situational), always in flux and evolving. Constructing identity/subjectivity within an educational frame that is environmentally caring will obviously inform and be informed by an epistemological/ontological frame concerning what counts as knowledge or knowing/learning.

Within an ontology that considers humans as both shaped by and shaping their environment, active participation in sociocultural practice is a fundamental educational provision. For example, the idea of school students working towards fuller (more extensive, more responsible, more cooperative) participation (that connects inner meanings with outer action) assumes a relational kind of knowing/being. This form of social theory grounds a theory of social learning that situates students' developing identity as representative of what one actually *does* in sociocultural/environmental praxis. Formation of identity (e.g., as environmentally conscious) is thus relational to active work on social/environmental meanings that people, in the process of their participation, transform into personal sense. Consistent forms or patterns of action make a person identifiable to others and to themselves. It is this relationship between action and meaning that actively locates learning at the intersection with identity formation (say as

environmental educators). If learning (within) is partly achieved in social space (without), then it seems reasonable to pursue the notion of learning as a relational construct within those arrays of possible educational spaces that locate identity/subjectivity as environmentally conscious. Of course, theorising a relational turn in learning necessitates being informed by issues associated with relation.

Popular conceptions of our 'selves' commonly place them somewhere deep within us, as somewhat bounded and contained (Probyn, 2003). However, recent research on the cultural nature of human development (Rogoff, 2003) raises crucial questions about the relations of power/ideology that permeate how identities/subjectivities are constructed and experienced. For example, feminist researchers argue that the body provides us with key knowledge about the working of our subjectivities. This embodied conception of subjectivity/identity, not as a contained identity but in constant contact with others, provides another base for considering subjectivity/identity as a relational matter. Probyn's (2003) idea that individuals are actively constituted through ideology raises other questions about whether we can recognise ourselves as embodied within the workings of ideology. Because ideology represents not a system of real relations but the imaginary relation of identity/subjectivities to the real embodied experience, environmentalism or sustainability might work through subjects who may or may not become more aware of the workings of these ideologies or discourses.

Environmental education can work to produce subjects that are at the same time inside and outside the ideology of education (as traditionally conceived). Educators who attempt such environment-related practice feel the tension or fragmentation that, Barrett (2007) argues, we cannot ignore. Being outside the frame, as De Lauretis (1988) says, in the 'space off' between ideology and reality, can become a play between dominant and self-representations. Viewing identity/subjectivity as a process and as a production within the spaces and places we choose to inhabit is relational. That is, how we choose to inhabit those spaces is interactive, embodied and contradictory. The idea of mobile, rather than multiple, subjectivities emphasises how they can get (re)configured across time and space (Ferguson, 1993). As Pratt (1998) says, it is in such spaces that we learn how to understand our ability to mobilise ourselves within notions of multiple subjectivities in order to disrupt them. It seems useful to think of subjectivities/identities in terms of how they are produced within particular circumstances and how they relate to questions of learning that 'space off' ways in which we can perform new modes of EE/ESD. Some clues to how this works may be found in research that is beginning to examine questions of how we learn to locate our narratives within various discursive practices of the social spaces we choose to inhabit.

Sfard and Prusak (2005) indicate that more conceptual work may be needed before the notion of identity can be used as an analytic lens for learning research. Their scrutiny of the 'old concept' of identity, associated with connotations of personality, character and nature, in terms of what they call the sociocultural turn in the human sciences, seems to provide openings into the deeper structural context of the cultural production of school failure that has remained largely unaddressed by educators, environmental educators included. By refocusing attention of what we actually *do* as humans and the mechanisms underlying our action, we can think of identity/subjectivity as a human construction constantly (re)created in interactions between

people or amongst people/society/environment (Bauman, 1996; Holland & Lave, 2001; Roth, 2004).

Understanding identity/subjectivity becomes pivotal in understanding why individuals, as active agents, play certain roles in shaping the dynamics of social life. Considerable work remains for researchers to clearly articulate how this may happen. Missing in the current discourse on identity is how it can serve as a more adequate conceptual bridge (than beliefs or attitudes) between learning and its sociocultural/environmental context. This paper is speculative/exploratory in the sense that assumptions such as the discourse-independent existence of beliefs/attitudes or the action/behaviour independence of prior intention are explored in terms of identity/subjectivity without knowing whether, in fact, identity/subjectivity is a missing piece in the individual-social bridge? Environmental education researchers, it seems to me, have been searching for clues in the language to more adequately conceptualise the process.

Research on learning in relation to identity/subjectivity now seems to provide a language that can help us to rethink our research in areas such as significant life experience (Palmer *et al.*, 1998; Palmer, Suggate, Robottom & Hart, 1999) and on teacher thinking (Hart, 2003). Thinking about significant life experiences in terms of a teacher's unique trajectory through discursive space (i.e., specific experiences within specific discourses) combined with the teacher's own narrativisation of it (see Mishler, 2000) as constitutive of (never fully forming and always potentially changing) core identity takes us beyond an essentialist vision of identity. Instead of being characterised as 'environmental educator', for example, a potentially less harmful, less reified version of subjectification foregrounds the teacher's own narratives as a link (however tenuous) to identity-making as a communicative practice. So, whilst identity can temporarily help to interpret the fluidity of change (globalising or local), the vision of 'identifying' as a discursive action (of doing) now seems more useful in characterising how teachers have come to be environmentally aware amongst other subjectivities.

Within this discursive space, identities defined in collections of stories about teachers that are reifying, endorsable and significant serve only as signifiers that may be contested in terms of credibility and generativity (see Juzwick, 2006; Sfard, 2006). Sfard and Prusak (2005) present an interesting ontological/epistemological dilemma as they attempt to clarify their vision of narrative-defined identity. The dilemma may be characterised as a debate between critical and post views of location/space. Would, for example, a critical realist perspective align with the position, following Wenger (1998), that identity/subjectivity is predominantly found in the action (the doing), the full lived experience of engagement in practice? Would a more poststructural positioning view identity/subjectivity as discursive counterparts of one's lived experiences? As Sfard and Prusak (2005) put it, it is our vision of our own and other people's experiences, not the experiences as such, that constitutes identities/subjectivities. Rather than viewing identities as entities residing in the world itself, their narrative definition presents them as discursive counterparts of one's lived experiences.

In positing a narrative theory of identity, designated identities, as stories that may have potential to become part of one's actual identity, are thought to give direction to one's potential actions and to influence deeds to a great extent, even in ways that may escape rationalisation. In fact, significant life stories may even make one feel as if one's whole identity has changed

(been transformed). These stories have power to contribute to the person's own narratives about themselves and others, although changing designated identities that have been formed in childhood is a particularly difficult task. Perhaps the research on significant life experiences should be revisited in light of the potential connections of identity to learning – that is, in terms of what counts in one's past or childhood experience, as critical to one's identity. Perhaps we would view learning more seriously in early childhood education in its sociocultural as well as its cognitive dimensions?

Whether identity/subjectivity is viewed in terms of direct action or as narratives mediated by action, the shift in thinking about applying identity as a conceptual 'tool' for understanding learning involves its emphasis on experiences (lived or discursive) and not some connotation of their traits (measurable, no doubt) as the focus of our inquiries. Sfard and Prusak (2005) theorise identity as a *relational* and dynamic process that changes on the basis of social learning as well as individual learning. This process-rich notion of identity/subjectivity provides a relational link for understanding social learning through individually constructed narratives. Identities/subjectivities, viewed as relational counterparts of one's lived experiences, can be used to define learning (i.e., as closing the gap between actual and designated/expected identity). Making this shift in thinking about social learning as relational in identity-forming, as well as meaning-driven and socially situated, is at the root, it seems to me, of what environmental educators have long been trying to express, without benefit of this new conceptual language about learning.

Re-Operationalising EE/ESD as Subjectivised Social Learning

Given the emergence of new discourses on learning (in terms of identity/subjectivity), it seems useful to (re)situate the theoretical/conceptual argument for the value of EE/ESD within a reconfiguring of education. That is, it seems necessary to locate learning (as identity-forming, meaning making and socially situated) within the landscape of possibility signified by a sociocultural approach to education. Given the proliferation of research focused on sociocultural traditions within the broad territory of sociology, cultural geography and anthropology, this is no small task. The focus here is limited to genealogical tracing of various theoretical frames/lineages that overlie sociocultural positions. Such tracing may provide some conceptual clarity for complex epistemological/ontological positionings that can be found in a deep working knowledge of those traditions from which one's work emerges (St. Pierre, 2000).

Assuming an alignment of many environmental educators with the trend in educational research away from simple correspondence theories of truth and reality, it is necessary to sort through various mixtures of mostly implicit epistemological/ontological theory deduced from actual use of methodology and method. Each of interpretivist, critical and poststructural worldviews problematise the relationship between reality and what we say about it, in their own way. Several educational philosophers and theorists have described these positionings that, according to Price (2007), are all based on the Habermasian (1972) theory of knowledge constitutive interests. Acknowledging their complexity, ambivalence, contradictions, and overlap, as well as the caution about reifying the categories, Price (2007) provides a possible categorisation of learning theories according to their assumptions of ontology and

epistemology (p.24). In recognising interpretive, critical and poststructural theories, she invokes Bhaskar (1989; 1993; 2002), Latour (1993; 1999), Haraway (1991; 1997; 2003; 2004) and others in positing tentative new 'relational' process theories based on a relativist epistemology but a qualified realist ontology. Her dissertation presents theoretical justification for this heuristic that reveals how educational theorists get around problems of philosophy using pragmatic arguments to justify their use of particular methodologies.

What is appealing about Price's (2007) positioning within critical realist ontology is the alignment with sociocultural views of learning as relational. Even more fundamental for environmental educators, particularly those with socially critical or postmodern skepticism, is how this alignment can help us think about the poststructural concern about environmental action as a willful contradiction (see McKenzie, 2004). By integrating a theory of action/participation to a relational politics of subjectivity, Price (2007) opens spaces where critical pedagogy intersects poststructuralism. Within such spaces in educational practice, teachers can mediate between individual and social constructions of the world in helping their students negotiate collective actions in areas such as social/environmental injustice, power imbalances within and amongst human (or nonhuman) interactions, and deconstruction of social structures that perpetuate hegemony. Although these approaches are meant to challenge received wisdom through reflexivity, participatory strategies and praxis (see Lather, 1991), they are less helpful concerning action/activism. To add a theory of action requires, according to Price (2007), an epistemological sleight of hand combined with a particular form of Peirce-like (1905/1998) pragmatism. An aporia created by this intersection of postcritical and pragmatic perspectives is that unequal power relations operate within participatory approaches.

Inspired by Bhaskar (critical realism), Peirce (pragmatism), Latour, Bourdieu, Haraway, and by O'Donoghue (1996), Price (2007) outlines a relational-processual theory that connects social learning theory to action/activism through Vygotsky's (1978) poststructural plurality, grounded in epistemological relativism (i.e., knowledge is relational-social and non-foundational). When combined with understanding the world as real – the ontological realism of Bhaskar (1989; 1993; 2002) – each of 'us' become embodied parts of it (Bateson, 1979; Beck, 1992; Plant, 2001) that can act intentionally on the world (Latour, 1993; 1999; Haraway, 1991; 1997; 2003; 2004). Subjectification is embedded in the tension of our ability to interpret, to embody, to live and to know as we experience the landscapes within discursive practices and one's positioning within them (Davies, 2000). Applied in practice, teachers and students together construct 'good enough' contextual meaning (truth) that can inform their actions acknowledging uncertainty and internalise (re-learning) something in the relational process that connects them, perhaps in transformative ways. Participatory action gives value to one's experience and identity/subjectivity (the social experience counts towards knowledge acquisition) yet recognises that our accounting of experience (e.g., in narrative) is fallible and requires intersubjective connections as well as reflectivity for validation. Thus, a relational approach to education grounds a relational approach to learning that searches for depth of understanding of social/environmental phenomena to inform action. Such an approach works through interrelationships and networks as the basis for action – as well as a processual 'be' (identity/ontology) coming through such learning processes to build knowledge.

While many people who think seriously about EE/ESD have poststructuralist as well as critical learnings, and can live with epistemological relativism when contemplating methodological action or social construction of knowledge (as relational), I suspect that they tend ontologically toward critical realism. As the argument goes, we do not expect to be able to act with absolute certainty but we feel that we must act to change a reality which does, in fact, exist beyond what our minds construct. Whilst acknowledging multiple perspectives where each representation can become reality, we also acknowledge the need to work against oppressions of various kinds through a praxis of willful contradiction (see McKenzie, 2004). Despite the work of several educators such as N. Gough (1991; 1994; 1999), A. Gough (1999), Bell and Russell (2000) and Morris (2002), as well as feminist poststructuralists (e.g., Weedon, 1987; Barron, 1995; Louseley, 1999; Britzman, 2000), it seems reasonable to suggest, with McKenzie (2004), that more explicit discussion is needed on how these post perspectives fit with the more activist agendas of much socio-ecological education. How environmental educators are meant to be dwelling in tensions created by such category contradictions at the intersection of poststructural and critical pedagogical frames remains a challenge.

Price (2007) suggests that relational-processual theory that networks pragmatism within qualified realist approaches to method, yet leaves methodology alone, may help to address such tensions. Forms of pragmatism, scrutinised as politically preferred constructions of the way forward, range from critical (e.g., Gough, 1997; Popkewitz & Brennan, 1998) to various consensualist forms (e.g., Sauvé, 1999; Chambers, 2004). Price's (2007) strategy is to illuminate 'preconditions' for each of these positionings within a relational politics of ontology/epistemology (related to questions about methodology). That is, we begin to realise that learning how we choose to frame and approach problems preconditions what we can learn. This kind of relationalist philosophy can be traced to holistic systems (Merchant, 2003) and to realist (but not positivist or empiricist) philosophy (Bhaskar, 1993).

As I interpret the argument, it is in the epistemological categories, rather than ontological distinctions, that we can interpret questions of pattern (Bateson, 1972). Such categories (knowledge constitutive interests) are preconditions for learning that is both individual and sociocultural. Such real but relational ontological groundings, joined to relational metaphors of learning (e.g., constellations, rhizomes, mycelia), invite us to see persons taking on agentive forms as identities/subjectivities within the flow of socioculturally shaped lives. Within such a philosophical frame, EE/ESD can be (re)viewed as naturally occurring within learning networks where experiences with significant others (Haraway, 2003) and significant life experiences are important as subjectivity-constituting processes.

Implications for EE/ESD

What remains is to encourage further thinking about social/relational processes of learning in EE/ESD implied by a relationalist philosophical perspective that works, as Haraway (1997) says, as a 'prophylaxis for both relativism and transcendence' (p.37). Such processes (as preconditions that undergird new learning theory) connect individual and social learning through meaning making, social situatedness and identity/subjectivity formation. Emphasis remains on identity/

subjectivity as means through which people come to care about and to care for what is going on around them (Holland, Lachicotte, Skinner & Cain, 1998). In 'becoming' environmentally 'savvy' citizens with agency, we reiterate and confirm those preconditions that made us – not determine us – in the reflexive and critical ways in which we actively (re)construct ourselves. We can be said to have agency in our critically reflexive ways of examining our conditions of possibility in which we both subvert and eclipse the discourse/practices that work to shape us as agents. These are active practices where the constituted character of the subject is the very precondition of its agency (Butler, 1995). They are 'models' that we (the subjective agent) find in our local culture/society and recognise as potentially determining but which can be disavowed as we learn to recognise our discursive dependencies.

Our work with teachers and students in the Canadian Youth Forum for Sustainability exemplifies one of many environment-related educational approaches where school action projects were studied as instances of social learning. In analysing their roles in interaction with students, both students and teachers experienced tensions in moving outside traditional passive roles and assuming responsibilities for local, community-based, social/environmental action. Analysis of interactions between secondary students and teachers illustrated how complex processes, on the take up and subversion of power, the disavowal of dependency and the accomplishment of a sense of autonomy from certain educational discourses, become obvious in changed circumstances. We begin what we think might be the kind of process that may allow participants and researchers to see how preconditions/framings work on learning processes within socially reconfigured practices (see Barrett, Hart, Nolan & Sammel, 2005). In attempting to understand how identities were re-inscribed in the struggle to (or recourse to) role-change from assumptions of 'good' teacher and student, we created conditions to encourage reflection on strategies used to escape traditional roles as a kind of double jeopardy. The process recognised that neither teacher nor student was powerless to change, but that some effort is required to recognise the dominant discourses at play. Agency may be found, it seems, within the spaces or silences within the taken-for-granted assumptions of discourse. Although role definitions existed prior to them, in the social 'outside', both teacher and student, on reflection, could choose to take up or submit to relations of power 'inside'. By creating different conditions, spaces were opened for the reworking of discourses such that identity/subjectivity could be confronted and agency questioned. The power that makes the social subject possible (in the first place) can be exposed in the will of the teacher or student to be the agent (of change). Is this the willful contradiction that faces environmental educators who, according to McKenzie (2004), can learn to recognise the political nature of their interpretation yet still feel the need to act?

Considering learning from a place of willful contradiction (i.e., standing close to the fire), as these teachers and students did, means dwelling in spaces of becoming more critically conscious and yet not disabled by such consciousness. It means learning to be political by realising that one's perspectives are biased yet, nevertheless, acting in the world, taking a stand (Lather, 1991: 25). It means recognising that the biased judgments (or theoretic fictions) that ground our actions exist as those little narratives (or discourses) about the world that are admittedly fictions rooted in local knowledge that is continually (re)formed and (re)fashioned depending on

shifting (fluid) circumstances and subjectivities. It means that subjectivity (identity) is continually reconstituted and that agency lies precisely within (enfolded) in its ongoing reconstitution. It means that we cannot ignore postcritical/poststructural discourses that work to identify those narratives through which we are constituted (Davies, 1993; 2000; 2003; 2006), and at the same time we cannot not act from a position of a moral epistemology of knowing people.

As Davies (2000) puts it, agency is recognised not as freedom from discursive constitution, but as the capacity to recognise that constitution for what it is, and to change the discourses themselves (p.67). In our Youth Forum work, our focus was centred on questioning the nature of the teacher-student relationship and in helping both to recognise their complicity to their own localised theoretic fictions by probing at the political conditions and circumstances within which they were constituted. Such disentangling of how we come to see and think may create conditions for seeing and thinking differently (i.e., questioning identity locations and understandings constructed in students' and teachers' everyday experiences at school). It may also help us to act more thoughtfully.

Just as being a teacher (or student) is a matter of being seen as such by ourselves and by others, being an environmental or education-for-sustainable-development educator is a matter of acquiring and (re)defining identity/subjectivity that is in some ways socially legitimated. If identity/subjectivity, as a complex system of meanings and representations which develops over time, is something people can use to justify, explain or make sense of themselves in relation to others and contexts, then we need to find ways to examine its shaping by social forms of power in order to find room for agency (Foucault, 1981a; 1981b; Bourdieu & Wacquant, 1992). Price's (2007) characterisation of Wals's (1993; cited in Wals & van der Leij, 1997) mixture of critical and phenomenological approach works to accommodate the problem of agency, as does McKenzie's (2004) mixture of poststructural and critical pedagogy. However, as McKenzie states, to engage students in such experience, that is, to create and nurture conditions where teachers and students can, in Lather's (2001) terms, locate their work in embodied, critical, cultural practices that encourage learners to become self-reflexive social critics capable of deconstructing the myths and meanings that dominate our own cultures (see Gough, 1991), is tough work. Taking up phenomenological or poststructural discourses that identify with narratives that constitute our subjectification (see Davies, 2000; 2006), that is, in 'seeing what frames our seeing' is but one of several difficulties surrounding the subjectivity of teachers, students, and environmental educators (see Ellsworth, 1989; Probyn, 2003).

Price's (2007) idea of relational knowing, from a critical realist perspective (i.e., relativist epistemology and realist ontology), when combined with McKenzie's poststructural idea of willful contradiction (i.e., feminist poststructural relativism), need not be viewed as inhibiting action as Price's (2007) characterisation of the 'posts' appears to be. Recognising our judgments to action as necessary fictions, as best approximations to action, seems most promising when enacted as a form of critical/reflective practice situated in sociocultural practices that give the most (at the time) subjective purchase. If we view learning as mixtures of personal and social biography, that is, as relational, then environmental educators can make choices about what and how to teach by making distinctions more consciously – by affirming positionings and affiliations that constitute important aspects of their professional/personal identities. The

choices are not arbitrary but consciously patterned around sets of traditions (i.e., ways of knowing and being) (see McIntyre, 1981) that embody and are generated by 'moral sources'. In many cases, the details of the traditions (ontology/epistemology) remain 'lost in translation' but they nevertheless work invisibly toward those understandings as they explore the narratives that produced them (as powers to open or constrain their choices). Such relations of power are the means by which teachers (environmental educators) construct/constitute our subjectivities/identities. We find a kind of agency in positioning ourselves in relation to other people who form the networks, rhizomes or mycelia of social learning communities.

If we view social learning within frames that implicate the wholeness of these philosophical yet practical traditions (in Bohm's [1980] and Price's [2007] terms, the whole becomes visible within each or any of the parts), such frames can become ontologically/epistemologically meaningful if they implicate us as subjectivities more conscious of our choices. It would be easier, for example, to see our practical decisions as educative – if we could articulate a participative worldview or perspective that could extend social dimensions of learning into ecological notions of sustainability (see Abram, 1996; Sterling, 2003). It would also be more productive of action because it reveals how we come to move from one way of construing learning to another, relative to the context and in relation to the perceived needs of students. Recognising a bias for participatory knowing (based on mutual participative awareness), for example, implies a kind of critical intersubjectivity that attends to grounding relations between social/relational forms of knowing/learning as well as action.

At what point, says Martin (2001), do we say we know something and act on it? What Torbert (2001) has described as 'consciousness in the midst of action' now goes beyond naïve subjective identity in actively seeking awareness. Such a reflexive stance of continually 'reframing mind' (Torbert, 2001) in narrative and community (self study and participation) is the means of divesting ourselves of our own presuppositions/preconditions. In Price's (2007) terms, we can begin to (re)consider our preconditions for our action (whether methodological or not) within the constructed, shared perspective of community. If our knowing and learning is set within contexts, traditions, frames that accommodate linguistic-cultural and experiential-shared ways of being, then the possibility of critical consciousness through personal reflection and social dialogue and practical exchange of experience can lead to collaborative inquiry. Such a view of learning in EE/ESD seems to have potential to work across differences in ways that question as well as educate and support each other – to disentangle the mycelial web that may permit seeing differently. But such a view – relational knowing/learning as a moral epistemology of knowing subjects – places us close to the fire, in poorly understood territory.

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Think Piece
Changing Thinking about Learning for a Changing World

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Introduction

As academics and evaluators working in the USA and Europe we are often asked to either assess the effectiveness of informal or free-choice environmental learning experiences, or to lend our expertise (coupled with solid visitor studies) to improve those experiences. What we encounter is an interesting conundrum: many environmental, conservation or preservation learning programmes or experiences start with goals or objectives that are extremely attractive to funders – changing visitors' or participants' understanding, attitudes or even behaviours in some profound fashion – and create a sense of importance and self-worth in those who devise these experiences. However, upon reflection and after a close analysis of the likely visitor experiences, many of these goals seem unrealistic, or seem to apply only for a small proportion of the target audience: those who are on the brink of changing. The reason for this apparent disconnect is manifold: the need to promise administrators, directors, agency heads, funders and donors 'impacts' and significant 'outcomes' leads to promises that are inappropriate or are difficult to meet; secondly, institutions operate under the banner of wanting to change – by themselves and through their own isolated efforts – those who are served by them; and mostly, those who devise and deliver these experiences may lack a deep understanding of the nature of out-of-school, informal or free-choice learning.

We will address the latter issue in this article since understanding the nature of learning that occurs outside the formal sector is relatively new and, in our experience, not widely shared. The purpose of this paper is therefore primarily to describe the main characteristics of what we refer to as free-choice learning for the environment, and to draw some conclusions on how this understanding can influence informal environmental education. We will argue here that a common perspective on education, namely that 'learning' results only or mostly from education, and that education occurs in schools and school-like environments, is too narrow a perspective in a world in which lifelong or lifespan learning outside formal schooling is becoming increasingly more important, and increasingly more recognised (Falk & Dierking, 2002).

Note: While we present this article as an argument for environmental education to better address free-choice learning, we want to make clear that formal education is a vital and necessary component in the life of an individual. It is, indeed, in the formal education system where most of the necessary tools for various literacies and learning competencies are developed – the very tools that are used throughout one's life to continue learning beyond school or university.

Learning – Beyond a Location

By now it is generally agreed that learning is a sensory-based process that involves cognition, affect, and skill (Bloom, 1956), and includes all forms of emotional learning, the ability to transfer what was learned, and the application of that which was learned in a classroom (or elsewhere) to other, new or novel contexts. There has been significant work in developmental psychology on the processes by which young children gain psychomotor skills and cognitive understanding; and, to a somewhat lesser degree, attention has also been paid to the affective development of young children. Lessons learned from early childhood education about the affective development of children are mostly (and not surprisingly) limited to the learning of a child; little effort has been made to extend our considerable knowledge of learning in the developing brain of children, teenagers and even young adults to learners of older ages or stages in life: adult learners who mostly learn outside of formal structures. This separation of study of natural learning as opposed to constructed learning in a formal setting is reflected by Schrank's (1972) biting observation that we learn by our senses up until the time we enter formal schooling at which point learning becomes 'non-sense' (p.1). Irony and sarcasm aside, it is only during our brief period of formal schooling that we are forced to learn, in lockstep with about 20 to 30 others, a content we haven't chosen – in a way that is determined by an authority figure (the teacher) who will assess our abilities through constant testing. After we leave school or university, we are again free to learn by and with our senses in the way we want. Even so, throughout childhood, there is considerable value given to sensory-based and affect-oriented developmental learning: sports, clubs, organisations and fraternal groups for youth are all considered to be 'developmental' in some sense. We tend to acknowledge that children need a variety of experiences to develop a moral compass, positive attitudes, a sense of self-worth and self-confidence, ways to deal with emotions and so on; in short, we see a pedagogical value in affective learning in and outside of formal schooling.

Upon entering adulthood there is a notable lack of appreciation for affective and developmental learning *as learning* [except maybe in cases where we are taught a 'life lesson' through emotionally difficult experiences like job loss, illness, death, divorce or similarly unpleasant experiences]. From childhood onward, with a few exceptions, there is relatively little focus in the literature on theories of learning in settings outside formal schooling or training. While many out-of-school venues such as museums, zoos, aquariums or nature centres declare their support for adult learning, most of their interpretation, exhibitry, programming or 'educational events' tend to be focused on children or 'families' even if the information and messaging (say about conservation in a zoo) is directed at the children with the adults in attendance.

Ultimately, and over the course of a lifespan, people learn most of what they know outside of school and formal learning arenas. Maslow (1954), Bruner (1973), Bloom (1976) and others have all suggested learning is a natural human process – learning does not begin and end at a specified time, or when someone external to the individual determines learning should occur. Many of us know that we have learned from a trip to a museum, zoo, or park; we have attended lectures or readings, read books that have taught us more than a good plot, and we

understand that there are times that we recall and use information that we obtained from the radio, television, newspapers, Internet, or magazines, or, for those communities where knowing is a different form of literacy such as experiential, from stories from elders, examples of cultural practice, and models of engagement. Most of us can certainly identify many situations in which we have gained knowledge and understanding from our experiences outside schooling, or even in our private sphere, where we learn from friends and family members through conversations and story-telling. Most of the free-choice or informal learning that occurs throughout a person's lifespan thus utilises skills – like functional literacy, for example – that are acquired mostly through schooling. It is an interesting paradox that even though most information is obtained outside the formal education system, much of the information available to us throughout our life is filtered through the tools learned in school, revealing that all learning is cumulative and that formal education provides us with the basic skills needed to participate fully in any of the learning opportunities that characterise informal or free-choice learning.

Often enlightenment of this incidental and truly informal nature is attributed to 'socialisation' within groups, but the socialisation contributes to the environment of how one learns, where one learns, and what is learned outside the formal learning environment. As noted by Jarvis (1986), 'since learning is a human activity, failure to participate in the educational institution does not mean that people are not learning' (p.10). As technology, global issues and other events continue to re-shape the world more rapidly than has previously been perceived, it is important to consider how people learn about the world around them. This paper chooses to explore some challenges in changing our thinking to truly reflect lifespan learning. We will explore some of the challenges connected to free-choice, informal learning in order to promote a realistic and appreciative perspective of lifelong and lifespan learning.

Informal and Free-Choice Learning

Learning, as suggested above, is situationally based in that the context of the learning or setting defines how learning will occur. Environmental education has long posited that good environmental education is good teaching and that lessons such as critical thinking will apply to a person's life beyond the educational experience. Such a belief *transcends* the situation. Even the frame 'good teaching' suggests that in this case, education is being tied to the *teaching* rather than the learning in the context. To this end, a question begins to emerge: what is it about *teaching* that might distinguish among settings and learning orientations that could inform practice for the betterment of learning? Museums, science centres, zoos, and other 'non-school' educational institutions and organisations would all argue that educational experiences are always driven by the learner. While from a learning perspective, and even from many operational perspectives, this is true, there is an inherent difference among formal, non-formal and informal education in the manner by which the educator or institution approaches the development of the educational experience.

Estimates within the USA suggest that, across a person's lifespan, approximately 3% of that individual's life is spent in school, university, training and professional development. There is a tremendous body of literature discussing, and often arguing, meanings of informal, non-

formal and incidental education (e.g., Faure *et al.*, 1972; Aikenpelu, 1980; Mocker & Spear, 1982; Maarschalk, 1988; McCombs *et al.*, 1991; Allmon, 1994; Heimlich, 1993; Cairnes, 2000). The authors believe that, for the purpose of instruction and planning, these distinctions are important and should not be minimised. Yet, for the *learner*, be it child, adult, professional, tourist, hobbyist, activist, parent or one of countless other roles, the boundary between life and all the non-schooled learning that occurs within it is seamless. The idea of free-choice learning shifts the perspective from that of institution to that of learner (Heimlich, 2005).

An oft-cited concern is that defining learning in out-of-school and lifespan education *versus* 'formal' education diminishes the value of what is truly lifespan, non-formal or informal education. One position heard in many situations is that defining learning as 'non-' or 'in-' formal reduces the value of the concepts, as the language itself uses a negative coupled with what is viewed as the positive (learning). These voices argue that a different term should be constructed for learning that occurs in places other than schools. One term that was initiated in museums and is quickly growing in the environmental and conservation fields is that of free-choice learning (see, for example, Falk, 2005).

Rethinking Our Thinking about Learning

If learning, then, is viewed from the vantage point of the individual across all situations and conditions, it takes on a perspective far removed from that of a child in a classroom. Commensurate with the tremendous opportunities are a series of alternative challenges to the ways we traditionally think about learning. As academics and consultant/evaluators are quickly able to identify, there are many misconceptions about informal learning by those who provide these experiences. Many of these problems lie in understanding what are attainable goals and realistic outcomes, given the different context of learning as compared to formal education. Some educators assume that visitors or community members attend to 'learn' what we want them to learn; others teach as if the participant is preparing to take a test – lots of facts, much directed information.

The problems appear to stem from a lack of understanding of the basic characteristics of free-choice or informal environmental learning, namely:

- Learners have their own agendas and desired outcomes
- Learners have their own motivations
- Learning is constructed meaning applied by the learner
- Learning is continual
- Learning is cumulative
- Learning is horizontal (it is synthesised across a variety of learning experiences)

Each of these is explored in greater detail below.

Learners have their own agendas and desired outcomes

In 1987, Beer found that slightly over half the visitors to one type of museum attended with learning as a purpose; most researchers (e.g., Cross, 1983; Hood, 1983; Miles, 1986; Hood & Roberts, 1994), however, have found the intentional learning to be much lower. The dominant

reason for visits found by these researchers was and continues to be social (see also Falk, Heimlich & Bronnenkant, in prep.). Visitors to institutions provide a tremendous potential audience for learning, but such learning must be based in the social interactions of the family or of social cluster of individuals. Learning is, at best, a secondary factor in attracting the visitor. The dominant agenda for a visitor or learner to any setting is to engage with others around a topic with which they identify. The informal educator must design the programme to support the learners' real agendas and build the institution's messages into the delivery. However, most educators assume that visitors are more similar to themselves than different in terms of desired outcomes from the visit.

The need of the individual drives what data are taken in, filtered, framed, and applied as meaningful. A strong dependence on human agency for learning leads to a bias in how we understand learning in the context of an individual's life (Pratt, 1993). The criticism of universality related to locus of control and the ability of all individuals to become self-motivated (Lee, 2003) reveals challenges to learning in marginalised, trans-cultural, cross-cultural and other situations where individuals may be discouraged from assuming these attributes (Alfred, 2003). The lesson for educators is to avoid seeing learners as a unified, generalisable group of learners, but rather to see the complex social constructions in which we operate. This position is both complicated and complemented by the environmental settings and contexts in which environmental educators work, and the unique relationships individuals have to those places that are related to the individuality of each person. Our messages are often competing with very real and visceral issues in individuals' lives.

People tend to go to those places or use those resources (e.g., television, newspapers, magazines) where they feel comfortable, places that are non-intimidating, user-friendly, and speak in the language of the uninitiated (Resnicow, 1994). Attractions such as museums, science centres, exhibits, parks and nature centres are often a draw and visitors to these attractions consciously or subconsciously seek to learn first about themselves and then about their cultural heritage – often implicitly in the sense of what of me and my history is in this place (Kramer, 1994). Note again how our message is relegated to an incidental role in the agenda of the learner. If a visitor, reader, viewer, participant does not feel grounded in the science of the institution or of the educator's programme that underlies the attraction or event, the likelihood of the experience being viewed as educational is reduced (Falk & Dierking, 1992; 2002).

Learners have their own motivations

Falk (2006) reviewed the literature and identified a wide variety of investigators who explored why people visit museums and other lifespan learning settings/attractions, these studies resulting in various descriptive categories of visitors. Recently, however, researchers have been looking at connections between visitors' entry motivations or characteristics and what they gain or learn from a visit or a programme (e.g., Falk, Moussouri & Coulson, 1998; Falk & Storksdieck, 2005; Packer, 2006; Bronnenkant, Falk & Heimlich, in prep.). In his review, Falk expanded on the suggestions made by Doering and Pekarik (1996) and Pekarik, Doering and Karns (1999) that visitors enter with an 'entry narrative' which becomes self-reinforcing and directs both learning and behaviour. Learners' satisfaction is then directly related to how the

individuals' narrative is supported or not. Although people have diverse reasons for choosing to visit museums or learning settings, their reasons appear to cluster around a limited number of motivations – motivations that seem to be strongly related to individuals' 'situated' identities (Falk, 2006). People often engage in activities with intentions that include learning, but the individual may not even be aware of the many intentions for making a decision to participate (Withnall, 1990).

To change the way we think requires an understanding that in lifespan learning, entry motivations and expectations differ from those expected and often anticipated by the educator (Morstain & Smart, 1974). It would be wonderful if people attended to our messages with the intent to learn; realistically, learning may be a secondary benefit – if even seen as a benefit from most people's engagement in our programmes, events, messages and efforts. As noted by Houle (1961) several decades ago, people engage in activities for personal goals, for the sake of participation, or for social reasons. Participation in lifespan environmental learning is voluntary and therefore cannot be prescribed in the same traditions as the education of children and youth (Rudd & Hall, 1974), and the content of such environmental education must be consistent with the interest and needs expressed by the target audience(s) to provide motivating forces for the individuals to desire to learn (Boone, 1985).

Learning is constructed meaning applied by the learner

What an individual truly learns is dependent on the meaning of the information to the person's life at that moment in time (Merriam & Clark, 1993; Knowles, 1996). How an individual perceives options for both choice and control appears to be necessary for self-actualisation or the willingness to take in new information and ideas (Bem, 1972; Steele, 1988; Csikszentmihalyi, 1990) which, in turn, sustains the integrity of personal identity (Heron, 1992; Marcia, 1993; Duval, Silvia & Lalwani, 2001). Several leisure researchers (e.g., Havitz & Mannell, 2005) have suggested that visitors to leisure settings enact identities specific to those settings; Haggard and Williams (1992) suggested that individuals affirm the nature of their identities through their choices and participation in leisure activities. Such findings are consistent with concepts in adult education related to social role, social identity and perceptions of self defining those activities in which an adult engages, and the outcomes from such participation (e.g., Kidd, 1973; Knowles, 1980; Galbraith, 1998; Dirkx, 2001).

Learning is continual

Learning is 'rarely linear and is always highly idiosyncratic' (Falk, 2005:269). How a person learns is unique to the individual (e.g., Rosenfeld, 1988) and is contextualised through the individual's personal, social or sociocultural and physical considerations (Falk & Dierking, 1992).

A person is continually surrounded by stimuli: based on where they are in their lifespan (developmental), how they receive and understand data or are hardwired neurologically (biological), their dominant motivation at the time (social), and the various ways they prefer to engage (characteristics), people learn in different ways at different times. As the social roles and societal expectations of an individual change over time and life expectations, it is necessary to consider learning as an integration of social, biological, developmental and characteristic

learning structures (Clark & Caffarella, 1999). Yet few individuals are conscious of such learning. This becomes problematic in that learning is often defined as cognitive tidbits, factoids, or recall – many, if not most people, are neither aware of nor believe in the self-mentoring strategies that humans continually employ as valid learning: talking to people, reading, watching how people do things, taking a class, and simply figuring things out (Darling, 1986, cited in Cyr, 1999).

Learning is cumulative

Most things that are 'learned' are slowly accumulated over time; an individual develops a means of making meaning from the wide array of information available and applying the meaning into their lives as is necessary or appropriate (Carlsen, 1988). Jarvis (1987) suggests when an individual has what is for them a significant experience, they identify that moment as learning, but that the individual may not be aware of the many different exposures to that message which have prepared them for this 'significant' experience. In many situations, learning is the result of exposure over time, but in the learner's mind is *compressed* into a single situation (Fischbein, 1999). Anecdotally, many educators in free-choice environmental settings such as zoos relate stories of individuals who 'remember visiting last year when you had X on display', with many of these comments coming from people who visit often – yet the exhibit in question was displayed several to many years in the past. Davidow (1996) notes compression as an issue of information equality and that learning should include time compression in the consideration.

Learning is a summation of data gathered over time; as a learner, one is rarely cognisant of the cumulative gathering of data that leads to knowledge. Dealing with compression and the cumulative effects of learning requires supporting what is natural learning. Effective free-choice education entails ensuring that experiences are affectively driven and are content or cognitively rich and engaging (Lane, 2004; Bain & Mirel, 2006). The means by which such structures are accomplished is to construct contextually rich learning materials embedded within a coherent educational content base – in other words, focusing on message and mission (Cassady & Mullen, 2006).

Marketing has long understood the need for repeat messaging and the power in focusing messages and social marketing has applied this to conservation action (e.g., Mckenzie-Mohr & Smith, 1999; Hanlon, Lane & Romano, 2000; AED, 2001; Maibach, Rothschild & Novelli, 2002). Educators could do well to apply the lessons of narrow messaging, supported by significant data, to free-choice learning. In a similar vein, the idea of content-rich, affectively driven learning is of tremendous value to environmental educators in lifespan, free-choice settings.

Learning is horizontal

Learning occurs seamlessly across experiences and venues (Falk & Dierking, 2002; Gutierrez & Rogoff, in press): what we learned about conservation in a zoo might get reinforced during a NOVA show and then entice us to read an article in *TIME* magazine about threats to biodiversity which makes us pay attention to a mailing asking for money to protect a habitat somewhere. We may not be deliberate in our efforts to combine learning experiences, but we create a social milieu in which our identity and sense of self gets constantly reaffirmed (and sometimes challenged), and we experience and learn about segments of the world that overlap

with our personal needs and desires (Rounds, 2004; Falk, 2006). Informal, free-choice learning occurs in a landscape of learning opportunities that can be mutually reinforcing.

Conclusions: Changing the way we think about teaching and learning in informal/free-choice settings

Learning is an individual ontological process, and in that sense there is no such thing as informal or formal learning. What we have shown, though, is that learning in different contexts is guided or supported by very different forces, and that our outcome expectations for learning processes ought to depend on the context within which learning occurs. Lifelong or lifespan learning outside of classroom structures is different from classroom learning, and we are well served to consider some of the following ideas when providing learning experiences for informal or free-choice learners, particularly if that learning occurs within the context of environmental education or education for sustainability (EfS):

- Understand the often complex agenda and the mixed motivations of free-choice learners. Free-choice learners who visit zoos, watch a documentary or visit a national park often seek to combine enjoyment and learning experience: for them, learning occurs through fun, and is mostly highly personal in nature. Jan Packer even termed this type of learning experience as 'Learning for Fun' (Packer, 2006). Environmental topics or issues of sustainability, however, cannot always be presented from a positive angle. A parallel concept to 'fun' and 'enjoyment' within the context of environmental education (EE) and education for sustainable development (ESD) could be 'satisfaction' and 'fulfillment' – terms that acknowledge the emotional need of the free-choice learner and the intrinsic motivation that guides the learning process.
- Understand your target audience and define it well. A programme that seeks to address everybody is most likely satisfying no-one as it will likely fail to serve individuals' needs, wants or expectations sufficiently. Solid front-end evaluation or needs assessment is crucial and is best embedded in a programme development model that links audiences to expected outcomes through clearly defined experiences.
- Lifelong, free-choice learners are not empty vessels: they come with prior knowledge and understanding – sometimes with heavy misconceptions and other times with knowledge exceeding that of the educators; they bring with them awareness, attitudes, interest and intentions and a lifetime of experiences leading to this moment. EE and ESD activities should therefore not just ask: who is the target audience and what is their agenda, but ought to include elements that recognise and even actively utilise existing knowledge, interest, skills and draw on previous experiences. Again, solid front-end evaluation is needed to uncover these aspects of one's audience, particularly since we know that learners are not necessarily open to new ideas if those ideas are not embedded into the learners' pre-existing cognitive and emotive backgrounds (Storksdieck, 2006).
- In contrast to a school environment, where educators can make some reasonable assumptions about the background of the students that they will address, free-choice or

informal audiences tend to be heterogeneous, even when they self-select to be present in your programme. It is only possible to understand your audience when you involve them, or when you talk to them, survey them or otherwise engage with them. This does not necessarily need to involve costly structured evaluations. One can provide many low-cost and low-effort opportunities to hear from participants, including brief conversations, short feedback forms, debriefing conversations – so long as one keeps an open mind for the need to hear from one's audience.

- There is no such thing as an average person: assuming learners in non-school settings are seeking the same outcomes from a single experience is to set up an educational programme for failure. Rather than understanding your 'audience', consider your many audiences – smaller groups with similar backgrounds can be addressed in similar ways, but the most eager participants and listeners should not be guiding a programme.
- Your impact, or audience outcomes, should be defined by target audiences and carefully calibrated to what is possible: don't overestimate the depth of impact you can achieve. Some audience members might be ready to change their behaviours, others might still be skeptical and need more convincing, but both could be in your audience. And sometimes you may have to 'speak to the choir' and support those who simply use a programme in EE or EfS to reconfirm their commitment to helping the environment (Storksdieck, Ellenbogen & Heimlich, 2005).
- Be aware that teaching as experienced in schools and universities is a bad guide to teaching in informal settings. People make their own meaning when they are not assessed and they take away what they want from an informal learning experience. Sometimes, what is truly learned is not realised in the learner until a later time. This is of critical importance to EE and ESD which operate from the expectation that the learner starts or remains on a path that ultimately allows the learner to make educated decisions which will take environmental or sustainability considerations into account. In EE and EfS we can easily win a battle, but lose the war, so to speak. For instance, a public speaker at a community event might have all the best arguments for why global warming is partially caused by humans, and provide a whole set of options in how we can address the issue as citizens and consumers; and yet, if that speaker does not understand the audience, their concerns, needs, and beliefs, and why they may still be skeptical or reluctant, or at least considers that having the facts on one's side does not suffice, the impact of the lecture could be rather small (or even smaller than a lecture's impact generally is).
- And lastly: Work with others. Integrate your offers with experiences that can occur afterwards (including repeat experiences at your site) and that occurred before. Think of your educational programme as one of many horizontal learning opportunities on any particular topic. There are likely other providers of EE or ESD in a community or a region. Research on learning in elective environments has shown that the cumulative effect or repeated exposure in a variety of settings and situations works best in moving free-choice learners along a path to better understanding, increased awareness, positive attitudes, and ultimately behaviour that is based on reflection of many factors, including

the learners' own disposition. Local EE and EfS should therefore be coordinated in ways that make them mutually enhancing and that provide learners who are at various stages of awareness and readiness to act in environmentally conscious ways that fit their needs.

It is our experience that a heightened appreciation for free-choice or informal learning across people's lifespans can help academics in their study of these experiences, and practitioners in providing highly satisfying and educationally valuable experience for their audiences.

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Think Piece
Learning of Environment(s) and Environment(s) of Learning

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Introduction

As we reflect on the 30 years that have passed since the first intergovernmental conference on environmental education that was held in Tbilisi, Georgia, it might be useful to review how learning of environment(s) has changed over time and also how environment(s) of learning have changed. And also, what challenges these changes present for contemporary societies.

The Tbilisi conference took place at a crucial time in human history, following sharpened awareness in the 1960s of human activity impacting negatively on natural systems. But, also a time when humans were still optimistic that environmental destruction could be reversed and that education might play a role in achieving it. What transpired at the conference might therefore be understood as a meeting where representatives of governments proactively defined objectives, goals and principles for guiding environmental education activities, in view of an impending socio-ecological crisis (at the time) (UNESCO-UNEP, 1978).

The focus of this short essay is on learning, therefore we first draw attention to some of the Tbilisi Principles pertinent to learning of environments and environments of learning. The first Tbilisi Principle suggests that environmental education should consider the environment in its totality, implying that learning about/in/for environments should involve all dimensions of environments and how these dimensions interact with one another. This Principle is linked to Principle 4 which states that the approach to learning should be interdisciplinary. Furthermore, Principle 2 states that learning should be a continuous lifelong process and Principle 8 states that learners should be active participants in planning their own learning experiences, and that they should make their own decisions as well as take responsibility for their decisions.

The Learning of Environment(s)

The conception of the term 'environment' has always been central to debates on environmental education and associated learning. Over time, the conception of environment has developed and changed from a strongly nature-ecology perspective to a human-socially influenced perspective and, of late, has seemingly gone full circle to a return to strong concerns about natural systems, the apparent loss of biodiversity, and threatened life-supporting ecosystems.

In the first published definition of environmental education, the focus was on learning about the biophysical environment and its associated problems (see Stapp *et al.*, 1969). In line with this definition, in the 1970s and 1980s we witnessed the inclusion of topics such as pollution and

nature conservation in the ecology section of school subjects such as biology and geography. Learning about the biophysical environment and its associated problems is of course important. However, there is a downside to only learning about the environment, that is, that in doing so we learn the lesson of hypocrisy. As Orr (1992) argues, when students learn about environmental problems, they learn that it is sufficient to know about them without having to do much about them. The Tbilisi conference was significant because it put forward a much broader conception of environment than the Stapp definition, opening up new ways of learning in relation to environment(s). As a consequence, we learned that environmental problems are complex and the products of interacting biophysical, economical, political and social dimensions. Furthermore, we learned that our knowledge of environment does not simply mirror what is out there, but that our conceptions of environment are culturally produced and mediated through language. As Di Chiro (1987:24–25) so cogently put it, 'We define [environment] by use of our own individual and culturally imposed interpretive categories, and it exists as the environment at the moment we name it and imbue it with meaning'. Moreover, Sauvé (2002:2–3) has helped us to identify several different conceptions of environment: environment as *nature*, environment as *a resource*, environment as *a problem*, environment as *a system*, environment as *a place to live*, environment as *the biosphere* and environment as *a community project*. Changing conceptions of environment were also associated with changing approaches to environmental education, enabling us to realise that we should not only learn *about* environment, but also *in/through* and *for* environment (Fien, 1993:15). Alternative approaches to learning about environments based on school textbooks have created expanded learning encounters whereby learners are able to spend time in environments and also, through active participation, engage in social action so as to help in solving local environmental problems.

We have learned the importance of place in environmental awareness and how, literally, places have changed over time. Orr (1992:126–127) writes that we are a displaced people for whom our immediate places are no longer sources of water, livelihood, friends, recreation, and so on. Rather, he argues we live 'amidst architectural expressions of displacement: the shopping mall, apartment, neon strip, freeway, glass office tower, and homogenized development'. As a consequence our intelligence of the Earth is waning and intelligence itself is becoming more abstract – our ecological literacy is on the decline. Guattari (2001) argues that through its technological arm, the media, Integrated World Capitalism (IWC) is producing human subjectivities that are domesticated, that is, passive, dull and uninspiring. The symptoms of the homogenising and normalising effects of IWC are evident in suffering occurring in the *three ecologies*: *environment*, *social* and *mental* (Le Grange, 2005). He writes:

> The earth is undergoing a period of intense techno-scientific transformations. If no remedy is found, the ecological disequilibrium this has generated will ultimately threaten the continuation of life on the planet's surface. Alongside these upheavals, human modes of life, both individual and collective, are progressively deteriorating. Kinship networks tend to be reduced to the bear minimum; domestic life is being poisoned by gangrene of mass-media consumption…. (Guattari, 2001:27)

And so, the world has changed since the Tbilisi conference, and suffering in the three ecologies has worsened. The pervasiveness of contemporary environmental problems has put a new face on the challenges confronting us in the 21st century. Some argue that ecological deterioration will soon eclipse ideological conflict as the national security concern in many parts of the world (Clover, 2000:213). Wars and civil struggle over diminishing resources such as water and fuel are already on the rise. In addition, within the next few years half the world's population will live in cities where existing scientific data already link air pollution and the destruction of green space to illnesses such as bronchitis, asthma, cancer, and other problems such as depression and escalating violence. In many ways this is a time of planetary crisis: a time when fundamental change is necessary for the global life-support system to remain healthy and operational.

We know that our knowledge of environment is socially constructed – that much we have learned – but the real effects of climate change, for example, are already felt and threaten to destroy much of the planet in the near future, including loss of food production, increased flooding, melting ice, the spread of diseases like malaria in Africa, and loss of land species. Perhaps a shift in the angle of vision is required as to how we view our relations with environments. It may be time for us to learn that although our knowledge of environments is and will always be socially constructed, it is the effects of problems such as global warming that will judge the adequacy of our accounts of it – not the reverse. As Matthews (1994:182) so neatly captures in a different context:

> The core … idea is that the material world ultimately judges the adequacy of our accounts of it. Scientists propose, but ultimately, after debate, negotiation and all the rest, it is the world that disposes … Ultimately, the concept is judged by the object, not the other way around. Just as volcanic eruptions are indifferent to race of those in the vicinity, … so also the science of lava flows will be the same for all. For … our science of volcanoes is assuredly a human construction with negotiated rules of evidence and justification, but it is the behaviour of volcanoes that finally judges the adequacy of our vulcanology, not the reverse.

We can substitute Matthews's reference to volcanoes with some of the most pressing environmental problems and the same argument will hold. But, what about the environments of learning?

Environment(s) of Learning

Guiding Principle 2 of the Tbilisi conference states that environmental education should be interdisciplinary, beginning at pre-school and continuing through all formal and non-formal stages. This Principle opens up the possibility of learning in different environments: in formal school settings, in places of work, local communities and in more or less natural settings. But it further suggests a movement away from textbook-based and transmission modes of learning. Much has been written over the past 20 years about the limitations of behaviourist learning theory and environments of learning which reinforce behaviourist learning. Constructivist

learning theory has discredited the idea that passive learning about environments can lead to behaviour modification. Constructivism has helped us to understand that learning is a complex process in which learners integrate their prior knowledge of environments with new knowledge introduced to them. Learners also learn in a social context and benefit from interactions with more capable peers or adults. The rise of constructivist learning theory has led to changed environments of learning, that is, environments that encourage active and cooperative learning and where learners draw on a variety of material resources from which to learn, including the local environment. Integrating personal knowledge with existing knowledge in the field is crucial to learning. If constructivist learning simply means that learners construct their own personal knowledge then such an approach would both trivialise and relativise environmental knowledge and thwart efforts at dealing with pressing environmental concerns such as climate change.

But outside of organised settings, learners are exposed to environments that are radically different to the way they were 30 years ago. As mentioned, urbanisation is occurring at a rapid rate across the globe, displacing people from their sources of food, water and livelihood. Contemporary learners are living at a time when the Earth is undergoing large-scale techno-scientific transformations. Learners are exposed to the Internet, cell phones, wireless laptops, Ipods, mass media, and so on. Through satellite transmission, events that occur in remote regions of the globe enter homes and penetrate the consciousnesses of those living thousands of kilometres away from the events. We noted earlier Guattari's point that the media is the technological arm of Integrated World Capitalism and is largely responsible for the erosion of the three interlocking dimensions of environment: nature, self and society.

Our argument, however, is that we cannot turn back the clock and long for the world to be what it was decades or centuries ago. Importantly, the new technologies that learners encounter and live with need to be viewed as potential holding places for alternative ways of living – the technologies can provide the escape from their potential domesticating, normalising and homogenising effects. Guattari (2001) argues that we cannot create new ways of living by reversing technological advancement and go back to old formulas, which were pertinent when the planet was less densely populated and when social relations were much stronger than they are today. New ways of living are to be found in responding to events (associated with Integrated World Capitalism) as potential carriers of new possibilities. As Pindar and Sutton (2001:9) write:

> It isn't a question of exchanging one model or way of life for another, but of responding to the event as the potential bearer of new constellations of Universes of reference. The paradox is this: although these Universes are not pre-established reference points or models, with their discovery one realizes they were always already there, but only a singular event could activate them.

We argue that education can play a role in creating conditions for activating the events that could enable learners to view or imagine the role of technology differently, that technologies can be the carriers of alternative possibilities that might help in addressing pressing

environmental problems. We therefore go along with Clover (2000:218–219) who indicates that it would require that, 'environmental education reaches out beyond the classroom and spill into the world that reproduces environmental problems – the everyday world where decisions and actions take place. Unless environmental education is integrated with home, workplaces, the informal social world lived outside the classroom, and the political and economic spheres, change will remain fragmented and hierarchical.'

Concluding Reflections

Over the years, the pendulum has swung from positivism on the one hand to constructivism (as social theory) on the other and, in terms of learning theory, from behaviourism to social constructivism. Constructivism has helped us to escape from the strictures of positivism, opening up possibilities of viewing environment(s) in multiple ways – for example, through conventional scientific approaches and also through indigenous ways of knowing. The Tbilisi conference started to open up these new possibilities. However, 30 years later environmental problems such as climate change might require of us to develop a greater sense of realism (without returning to positivism). We might need to, for example, come to the realisation that coastal cities might be flooded in 50 or 60 years' time (with all the associated consequences), irrespective of our culturally mediated or socially constructed views of climate change.

Another matter worth mentioning is that a great deal of what we have learned with respect to environment(s) and environments of learning is firmly ensconced in the academe but very little may have filtered down to schools. For example, in South Africa much has been written about the Tbilisi Principles in academic theses and journals over the years. However, it took 12 years before Tbilisi was mentioned in an education policy document in South Africa – selected Tbilisi Principles were mentioned for the first time in the 1989 White Paper on Environmental Education. However, this process was thwarted because of political change in South Africa and due to criticism that the White Paper process was not broadly inclusive. Six years later (in 1995) an Education White Paper was produced by a democratic South African government in which environmental education featured as a key principle in this document. In 1997 (20 years after the Tbilisi conference), a new curriculum framework has been developed in South Africa in which environmental concerns feature strongly for the first time. A concluding point which we wish to make is that all opportunities for addressing environmental concerns need to be used – that we can't wait for a new policy or national curriculum framework to first be put in place before we act. We have to learn to work within the wide range of learning environment(s) where people can potentially learn, with their attendant structures and frameworks, and view them as the potential bearers of possibilities for addressing environmental concerns.

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Think Piece
Learning to Think Differently

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Introduction

If I have correctly interpreted the intentions of the organisers, the concern of the 2007 World Environmental Education Congress is not learning for accommodation to the dominant direction of change in the world today. It is rather a concern for learning to challenge the direction of this change, for learning how to visualise an entirely different trajectory, and for learning the skills and developing the courage needed to pursue such a vision effectively. By the term 'dominant direction of change' I refer, of course, to the cumulative and ever-accelerating effects of economic globalisation, social disintegration and ecological destruction that go by the names of 'development', 'modernisation' and 'trade liberalisation'. Education in support of this dominant direction of change aims at producing a standardised, technically-competent and pliant individual for global business and a mass of enthusiastic consumers. Most educational scholars today participate in parts of the existing educational system that promotes this agenda, be it school or university. We are all products of this system and we work within it. Hence our thinking is often circumscribed by the assumptions underlying that agenda. Addressing the 2007 World Environmental Education Congress theme 'Learning in a Changing World' more thoughtfully (as was the invitation for submission of these 'Think Pieces' for the *Southern African Journal of Environmental Education*), however, signals our intention to question these assumptions.

In effect, environmental educators have been questioning the assumptions of mainstream contemporary global culture for the past three decades. We broadly agree among ourselves that environmental education and education for sustainable development are, above all, about 'learning to think differently about the world and ourselves'. But what exactly does this phrase mean? What is involved in learning to think differently? In my opinion, we have not yet really come to grips with these questions.

Still, I would say that our joint efforts over the past 30 years (since Tbilisi) have brought us to the possibility of truly understanding what it means to think differently and how we might achieve it. There have been a number of promising ideas, but we have not really followed through on them. Take Stephen Sterling's concept of third-stage learning that questions existing assumptions (Sterling, 2001; see also Sterling, this edition) and Edmund O'Sullivan's concept of 'transformative learning' (O'Sullivan, 1999). To follow these up we need to pursue our enquiries at a deeper and more comprehensive level than hitherto. What are the assumptions we need to question? What is the process by which transformative learning occurs?

Judging by the historical record, transformative learning is a process that has occurred

spontaneously in Western civilisation at certain times of critical social change in the past – in Greece of the 4th and 5th centuries BC and in Western Europe in the 17th century AD. How exactly did it happen then? Is this what is beginning to happen in contemporary global culture today? What exactly is happening today? In this paper I would like to address these questions, at least in a preliminary way.[1] This might help in defining an agenda for further work.

Definitions

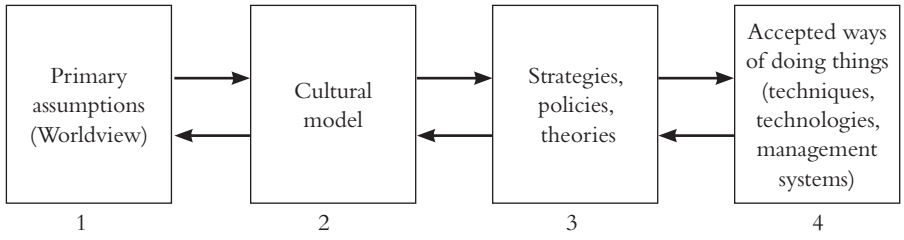
To facilitate a meaningful discussion of what is involved in 'learning to think differently', or transformative learning, we need an adequate terminology. This terminology is slowly emerging in educational circles today and as a result we are as yet unable to fully think constructively about this issue and to communicate with each other effectively. 'Thinking differently' means using altogether different basic concepts, and also a different mode of thinking than the exclusive logical, discursive mode we use at present. The term 'basic concepts' refers to those primary assumptions we make about the nature of the world and ourselves. It must be emphasised that these are assumptions, and not matters of fact; they are speculative assumptions about how the world might be. They are our answers to what I term the perennial questions. These questions are: What is the world like? Who am I? What is real? Contemporary global culture is based upon the answers to these questions that the European Enlightenment thinkers formulated in the 17th century. With this Enlightenment worldview unravelling before our eyes, we need to ask these questions again and seek to answer them afresh. This is widely recognised today, but for the lack of an adequate definition of the word 'assumption' progress is blocked.

I wish to suggest that there are two types or levels of assumptions that must be distinguished: primary and secondary. Primary assumptions are answers to the perennial questions. The answer to the question 'What is the world like?' must necessarily be framed in terms of speculative definitions of each of the basic categories of thought: matter, life, time, space, causation, the person and knowing. These answers are then assembled into a logical and coherent system. Secondary assumptions are derived deductively from the primary assumptions and are the guiding principles for a cultural model. Examples of secondary assumptions are 'competition' and 'sustainability', concepts that figure in the contemporary global cultural model and in the alternative model that is struggling to be born, respectively. These concepts depend for their legitimacy on the primary assumptions about life, matter, causation and the person in their respective worldviews.

This distinction between primary and secondary assumptions can be expressed in terms of a diagram that depicts the relationships among 'worldview', 'cultural model', 'policies/programmes/theories/projects', and 'practice' (Figure 1).

The new system, or worldview, is initially formulated (Stage 1) without explicit reference to experience; that is, it is freely speculative. Subsequently, it may be necessary, in light of experience, to revise these assumptions or at least our formulations of them. This is indicated in Figure 1 by the double-headed arrows; i.e., the process of creating a new worldview is an iterative one. The final test is always that of adequacy in practice (Stage 4). The transformative learning process includes all four stages in Figure 1.

Figure 1. This diagram shows how a worldview translates into accepted ways of doing things, and how failure of these accepted ways of doing things feeds back to the stage of the worldview, modifying it



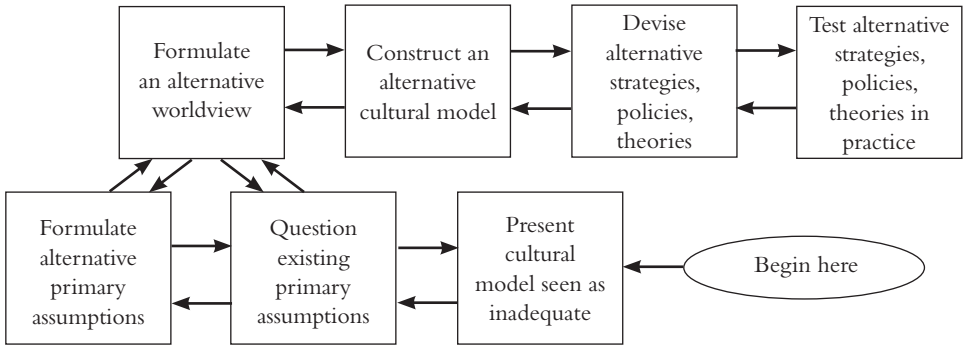
(Source: Jackson, 2003)

In attempting to define the basic categories of thought afresh, we are brought up against the limits of the logical discursive mode of thought that characterises Western civilisation since Hellenic times. We begin to understand the need to supplement this with the ability to grasp complex concepts intuitively. The means of articulating such intuitions is the language of metaphor, of myth, characteristic of non-Western and pre-Hellenic Western civilisation.

The Process of Learning to Think Differently

In the foregoing discussion of terminology the transformative learning process has been sketched in outline. It is now necessary to consider how the actual process occurs. A schematic description of the process is suggested in Figure 2. A number of transformative learning experiments have been conducted (see, for example, O'Sullivan, Morrell & O'Connor, 2002; O'Sullivan & Taylor, 2004), but when considered in relation the generalised description in Figure 2, it is clear that all of them have been incomplete, most notably in giving no attention to primary assumptions. The very aim of transformative learning, however, is the creation of an alternative worldview.

Figure 2. This diagram describes the transformative learning process. Alternative practices are devised and tested. The results then feed back into the process, confirming alternative assumptions, or indicating the need for still further thinking



(Source: Jackson, in press)

Transformative learning occurs in three distinct phases: (1) the recognition of cognitive dissonance; (2) 'standing outside oneself'; and (3) testing. This overall process occurs in the individual, although it rarely happens in isolation from society. Transformative learning is most effective when it occurs in small, highly interactive groups. As these small groups interact with other such groups, in ever-widening networks, a point is ultimately reached where a critical mass of people have begun to think differently. A cultural transformation then occurs as a matter of course.

Cognitive dissonance

Cognitive dissonance (Haigh, 2001) occurs when the facts of contemporary experience contradict expectations based upon our inherited assumptions about the world and ourselves. This is often very painful, emotionally and intellectually. Understandably an attempt is made to relieve the tension by dismissing the inconvenient facts, or explaining them away. The threat to existing intellectual and power structures is met by them with waffling, 'greenwashing', and by the invention of oxymorons like 'sustainable development'. However, with some individuals, in some circumstances, when the intensity of cognitive dissonance reaches a threshold level, a breakthrough is achieved to the next stage. A person accepts the fact that the only real way to relieve the tension, to resolve the contradictions, is to pause to examine his/her assumptions. In explicit transformative learning exercises activities can be planned that increase the intensity of cognitive dissonance by highlighting the contradictions and by exposing the manoeuvres by which the mind seeks an easy way out.

Standing outside oneself

This expression refers to the ability to recognise, describe and critique our inherited assumptions – to 'standing outside ourselves', so to speak, looking in with cool objectivity. It is not easy. These assumptions are largely unconscious, and are therefore not seen as assumptions, but simply as a true picture of the world 'as it really is'. Here a group learning exercise is invaluable; it gives us the encouragement, security, and a glimpse of ourselves through others' eyes that are necessary to explore effectively our most intimate attitudes and their determinants.

If critical examination of secondary assumptions leads to the conclusion that they are defective, and if this is followed up by a similar examination of the primary assumptions behind them, leading to the conclusion that these too are defective, the stage is set for a consideration of possible alternative primary assumptions. Such alternative assumptions may be formulated *de novo* or they may be traditional assumptions – reformulated if necessary. The attempt must then be made to coordinate these alternative assumptions into a logical and coherent system – a worldview.

Testing

Like the previous phase, this phase too consists of several distinct tasks. The first is to deduce appropriate policies/programmes/theories/projects from secondary assumptions which can be tested in practice. The feedback from such testing must then be critically evaluated. The test practice can be considered successful if it solves a hitherto insoluble problem. (Some

problems may actually disappear even before testing begins since in terms of the new secondary assumptions they are no longer seen as problems.) If the feedback is negative it is then necessary to back up and reconsider policy/programme/theory/project formulations, or even further to reconsider secondary assumptions – and maybe primary assumptions too. As was said earlier, transformative learning is an iterative process.

Transformative Learning in Post-Colonial Societies

The 2007 World Environmental Education Congress is being hosted for the second time in a post-colonial country (first Brazil in 2004, and now South Africa in 2007) with a relatively greater representation of post-colonial societies. It is appropriate, therefore, to consider the special problems of transformative learning in such societies, and also the opportunities they present. In Western societies the learner is confronted with two worldviews. The first is that which underlies the contemporary global cultural model, and the second is that which is implied by the many alternative secondary assumptions that he/she finds resonate positively within him/her. As such, the learner must struggle to recognise, articulate and critique all these assumptions, inherited and alternative, primary and secondary, and then pass on to creative speculation. In post-colonial societies the challenge is more formidable still. Learners here must similarly and simultaneously deal with their traditional, inherited cultural model and its supporting worldview.

The problem is that traditional cultural models have been discredited and ridiculed by the Western colonisers of these societies and thus delegitimised. Incentives were also offered to those who could successfully take on board the cultural model and worldview of the colonisers, and so help them with their work of colonisation. This occurred in those colonies where the colonisers' aim was primarily economic exploitation for the benefit of the colonisers – as in India. Where the aim was settlement, the situation was worse. Indigenous peoples were killed off, dispossessed of their natural resource base and segregated – as in North America and Australia. This was traumatic for indigenous people, and the result was personal and social disintegration. Of the two, the challenge before the victims of settlement colonisation is far greater.

I have sketched the two extremes of the colonial experience to highlight the issues involved. In some instances the situation appears to have been a mixture of these two types of colonisation and is consequently more complex.

By and large the traditional worldview of the people subjected to economic colonialism was not destroyed but merely overlain by the modern Western worldview in which they chose, for their own survival and wellbeing, to participate. Development, modernisation and now globalisation are, decades after political independence, still reinforcing the Western cultural model and worldview in this way. To articulate and then critique their traditional worldviews in the face of this is extremely difficult for most people. They are ambivalent, uneasy with the Western worldview, and at the same time see conforming to it as in their own immediate best interest. Nevertheless, their traditional worldview is intact, even if submerged, and the increasingly apparent dysfunction of the contemporary global culture model is providing an incentive to step back and contemplate alternatives – of which one is clearly their own

traditional one.

The people who suffered settlement colonialism, by and large, were never allowed or encouraged to participate in the culture of the colonisers. Their attitude to the Western cultural model and worldview might be said to have been predominantly one of incomprehension and dismay. Fortunately, some of their old stories remained in the memories of the older people. These are slowly being resurrected and their relevance today is being discussed. In this these communities are being encouraged by a few of their own people who somehow made the transition to mainstream culture, and by a genuine interest being shown by people of the mainstream who are questioning the contemporary global cultural model.

In summary, increasing numbers of people in post-colonial societies are now clear that the Western cultural model has no future for them, or for the world at large. But their traditional models, unless they are intelligently, imaginatively understood, seem irrelevant. The language of myth must be (re)learned. Given this understanding their traditional worldviews can effectively be searched for concepts that are relevant to their immediate context. That context is both local and global. They can in this way recover their own cultural identity, exorcising the last debilitating effects of the colonial experience, while at the same time making a vital contribution to the transformation of the worldview of global culture, based until now exclusively on the Western Enlightenment model.

Transformative Learning in Practice

As I see it, cultural transformation involving a radical change in worldview is a natural, spontaneous phenomenon that occurs at certain times in history. Now is one such time. All of us will inevitably be involved in it. The question is: do we participate in the process with understanding and so, perhaps, facilitate it, or do we resist and so intensify the damage and suffering that inevitably accompany it? Facilitation takes the form of conscious transformative learning, carried out at both personal and group levels. I suggest that the model of the transformative learning process briefly presented in this paper can lead to a clearer understanding of what is happening, and thus enable us to accept it, and can also guide us in designing and conducting explicit transformative learning exercises.

A generalised transformative learning course outline (Table 1) is suggested as a basis for mounting exercises in various contexts. A given course can begin at Step 1, or at a later step, depending on the initial position of the learners for whom it is designed. Thus, learners who have never experienced cognitive dissonance should begin at Step 1. Activities are designed to enable them to recognise contradictions in contemporary life and to prevent them from explaining such contradictions away. Those learners who have already done this on their own can start off at Step 2 – in which learners are confronted with contemporary everyday problems that are insoluble in terms of the worldview they now assume, and so intensify cognitive dissonance. For those who are already involved in designing policies/programmes/theories/projects based on alternative secondary assumptions, it is enough to begin at Step 3.

Table 1. A general transformative learning exercise format

Step 1	Creating cognitive dissonance
Step 2	Confronting insoluble problems
Step 3	Identifying and defining secondary assumptions – present and alternative
Step 4	Primary assumptions in the background – identifying and describing them, both existing and alternative
Step 5	On to testing
Step 6	Handling feedback

A transformative learning course needs to be tailored to the context of learners. Thus a course for agricultural scientists would be different in detail from those for business consultants, environmental educators, and illiterate rural people.

The transformative learning course facilitator must be steeped in the context of the specific group involved. Further, he/she must have a clear understanding of the theory of transformative learning and must have served as an apprentice in transformative learning exercises. 'Training up' transformative learning facilitators may not be possible. A competent facilitator requires intuition, quick response and adaptability; to suppose that these can be imparted in a conventional training course is unrealistic. These are skills that can only be learned on the job.

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Endnote

1 For a more comprehensive and detailed account see Jackson (in press).

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Think Piece
Re-badged Environmental Education: Is ESD more than just a slogan?

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Introduction

In the field of environment-related education, the period from the early 1970s to the present is marked by both continuity and contestation. There has been a remarkable continuity of interest in linking education and environment (especially, but not only, in schools); and there has also been contestation and resultant evolution in the language of the field, with terms like ecology education, environmental education and education for sustainable development becoming highly visible at different times. Environment-related education represents an interesting case in educational innovation – one being played out at an international level.

In particular, we are currently in the throes of a situation in which the environment-related work formerly known as 'environmental education' (EE) is being aggressively and extensively 're-badged' as 'education for sustainable development' (ESD). There are strong attempts internationally to supplant the use of the term EE with the newer term ESD; most of these attempts are associated with the current international United Nations Decade of Education for Sustainable Development. The Decade of Education for Sustainable Development (DESD) runs for the period 2005–2014, and is gathering pace across the world (Selby, 2006). Speaking at the international launch of DESD in New York in March 2005, UNESCO Director General Koichiro Matsuura suggested that

> The ultimate goal of the Decade is that education for sustainable development is more than just a slogan. It must be a concrete reality for all of us – individuals, organizations, governments – in all our daily decisions and actions, so as to promise a sustainable planet and a safer world to our children, our grandchildren and their descendants… Education will have to change so that it addresses the social, economic, cultural and environmental problems that we face in the 21st century. (UNESCO, 2005:2)

Now that the United Nations has taken this concept on board in such a significant way in proclaiming a Decade of Education for Sustainable Development, ESD is clearly supplanting environmental education in the language of environment-related education.

What does this change in language mean, and what lessons can be learned from the 'environmental education' experience for the proponents of the newer term 'education for sustainable development'? We could ask whether the evolution in the language of the field has been accompanied by real change in educational practices beyond the changes in descriptors

– beyond mere language (including its more institutionalised forms of discourse and policy) to levels of organisation and, especially, practice. And if these changes in language, discourse and policy are not attended by related qualitative changes in practice, how may the significant time and expense involved in the Decade be justified? Vocationally, in terms of opening up new careers for academics and international policy consultants? Politically, in terms of creating at least a perception of development in the field? Or economically, in that the changes in language/descriptors of the field have resulted in more palatable terms and concepts for potential funding agencies?

In this paper I'd like to present a perspective on the effects of the language of the field of environmental education, and from this to pose some critical questions concerning the re-badging of 'environmental education' as 'education for sustainable development'. How may this major shift in language be understood? What are we to make of the UNESCO Director-General's assertion that 'The ultimate goal of the Decade is that education for sustainable development is more than just a slogan'?

The Slogan System in Educational Reform

The work of Tom Popkewitz on 'slogan systems' in educational reform may be useful in seeking to understand the major shift in language in environment-related work.

In exploring instances of school reform and institutional life, Popkewitz (1982) refers to the 'myth of educational reform' and proposes the role of 'slogan systems' as one key agent in the maintenance of changeless reform:

> In many cases reform activities take on ceremonial or symbolic functions. The rational approach offered by reform program demonstrates to the public that schools are acting to carry out their socially mandated purpose, and that the procedures and strategies of reform offer dramatic evidence of an institution's power to order and control change. But the ceremonies and rituals of the formal school organization may have little to do with the actual schoolwork or with the teaching and learning that goes on in the classroom…
>
> The legitimizing function of reform can be clarified by examining the symbolic nature of slogans. The terms 'individualization', 'discovery approaches,' and 'participation' are slogans, each of which symbolizes to educators a variety of emotions, concepts and values, just as terms like 'democracy' and 'national security' symbolize the values and aspirations of political groups. Slogans, however, are symbolic, not descriptive: they do not tell us what is actually happening… Reform ban be a symbolic act that conserves rather than changes. (Popkewitz, 1982:20)

The slogan system notion was originally proposed to expose changeless reform (adoption of a new and high-impact name in absence of any real change in practice). For Popkewitz, adoption of an active, high-profile slogan has at times been associated with a process whereby practitioners seek the benefits accompanying a concept that carries contemporary popularity

(and an instantly recognisable name-as-slogan) by simply adopting the slogan symbolically, while retaining practice in largely unchanged form.

The Slogan System in Environmental Education

As is well known, environmental education has been defined in terms of three dimensions, 'education *about* the environment', 'education *in* the environment', and 'education *for* the environment'. Interpretation of environmental education in terms of either of the first two dimensions ('about' or 'in') enables, encourages and justifies certain environment-related activity to be engaged in – and environmental education said to be happening because these activities are taking place – within teaching/learning situations that are conventional in terms of their disciplinary structure, informational content and teacher/student interactions. These activities are recognised as being environmentally *educational* (their coherence with educational structures and practices fosters this interpretation); they are, however, not distinctively *environmental* education in the sense of 'education *for* the environment'. Of the three dimensions, 'education *about* the environment' is far more readily assimilated into existing structures and practices than 'education *for* the environment'. The generic nature of the term 'environmental education' permits an equivocation about what will actually happen and thus encourages change that is symbolic only.

That is, in the case of environmental education, precisely because there have been three accepted approaches to environmental education practice (of course there is overlap between these) it is possible (and completely acceptable) for EE practitioners to employ the label of EE to describe their practice in any (or all) of these approaches. Given that 'education *about* the environment' is closest to established practice for most teachers, is closely aligned to existing school structures and is perhaps less demanding, it is no surprise that most activity conducted in the name of environmental education is along the lines of 'education *about* the environment'. The slogan system in EE permits and perhaps encourages practitioners as a group to emphasise 'education *about* the environment' to a greater extent than the more reformist 'education *for* the environment'. An outcome of this is that environmental education tends to reproduce a conservative scientific (and perhaps scientistic) perspective on environmental issues and their resolution.

This situation then invites critique from commentators who perceive an emphasis in environmental education practice on awareness development ('education *about* the environment') as a failure, noting a lack of attention to social and economic considerations. Some authors (for instance, Walker, 1997) suggest that the 'social change' agenda of 'education *for* the environment' is too demanding for teachers and schools, while others base a warrant for another environment-related reform effort (education for sustainable development) on this perceived lack of attention to social and economic considerations. For example, Tilbury (2004:103) argues that:

> [ESD] differs from commonly practiced environmental education approaches in that it [ESD] goes beyond addressing values and attitudes of the individual to build their capacity for instigating and managing change.

And the UNESCO Director-General in 2005 is even more direct:

> Education will have to change so that it addresses the social, economic, cultural and environmental problems that we face in the 21st century. (UNESCO, 2005:2)

However, what is interesting about these arguments for ESD is that they are not comparing apples with apples. Inspection of the institutionalised language of environmental education reveals that it is in fact clearly concerned with social, economic and political dimensions of environmental issues. For example, UNESCO reports in 1978 assert that:

> 1. Whereas it is a fact that biological and physical features constitute the natural basis of the human environment, its ethical, social, cultural and economic dimensions also play their part in determining the lines of approach and the instruments whereby people may understand and make better use of natural resources in satisfying their needs. ...
>
> 3. A basic aim of environmental education is to succeed in making individuals and communities understand the complex nature of the natural and the built environments resulting from the interaction of their biological, physical, social, economic and cultural aspects, and acquire the knowledge, values, attitudes, and practical skills to participate in a responsible and effective way in anticipating and solving environmental problems, and the management of the quality of the environment. ...
>
> 5. Special attention should be paid to understanding the complex relations between socio-economic development and the improvement of the environment. (UNESCO-UNEP, 1978:2)

In criticising environmental education, ESD protagonists cannot base their warrant for ESD on the basis of a critique of the established *language* of environmental education; rather they point to what they see as inadequacies in environmental education *practice*, and then proceed to argue for a *new language* of environment-related work (ESD). This leaves unaddressed the issue of just what form successful ESD practice would take.

In summary so far:

- the language of environmental education embraces three dimensions of environment-related work, which in turn invite a range of interpretations at the level of practice;
- one of these dimensions emphasises engagement of social and economic aspects of environmental issues;
- practice in environmental education is perceived as failing to adequately engage the social and economic aspects emphasised in the language of environmental education;
- this situation is advanced as an argument for a new language of environment-related work – education for sustainable development; and
- this argument depends on a comparison of ESD language with EE practice.

A relevant question now is whether the language of education for sustainable development is

any more effective than environmental education in enabling reform in environment-related educational practice, or will it constitute yet another slogan system, contrary to the expectation of UNESCO that: 'The ultimate goal of the Decade is that education for sustainable development is more than just a slogan'?

The Slogan System in Education for Sustainable Development

According to recent literature, the ESD concept rests on 'the three pillars' of ecology, society and economics. Put another way, ESD sees sustainability issues as located conceptually at the intersection of three sets of contending human interests – ecological, social and economic (Henderson & Tilbury, 2004; UNESCO, 2004; DEH, 2005). Sustainability issues consist of arguments among proponents of these three kinds of interests. In addition, an important consideration when resolving these contending interests is the need to reconcile the rights of current and future generations in terms of their access to natural and social environments. So, if ESD is to be regarded as a distinctive form of environment-related education, it must focus on adopting an educative approach about sustainability issues – to improve the capacity of learners to comprehend, participate in and hopefully become better at resolving the contentious clash of ecological, social and economic interests in our environments. In short, ESD focuses on environmental issues for which there are discernible ecological, social and economic interests in dispute, and to provide learners with opportunities to engage with and witness the resolution of these issues.

ESD is a comfortable term in that it suggests a continuation of what we value and what works for us. There need be no real challenge in the idea of sustainability – we can relax in the comfort of a continuation of our current living conditions. It is comfortable because it is open to interpretation in ways that remain unchallenging for established practice whatever that may be (whether it reflects ecological, social or economic interests). In other words, the language of ESD, like that of environmental education, serves as a three-dimensioned slogan. Just as the term 'environmental education' may be interpreted in any of several ways (including as 'education *about, in* and *for* the environment'), the ESD slogan may be interpreted as promoting any or all of ecologically sustainable development, socially sustainable development, or economically sustainable development.

The lesson that may be gained from the way in which the slogan system expresses itself in the field of environmental education is that where there is a slogan system that invites different interpretations at the level of practice, the interpretation most likely to dominate is the one that coheres most closely with dominant interests in the context of implementation. In the case of EE, this is 'education *about* the environment'; in the case of ESD it is economically sustainable development. Having defined sustainability issues in terms of their residence at the intersection of competing ecological, social and economic interests, we cannot assume that the contest is played out on a level playing field. By their nature, economic interests are easier to state in precise and compelling terms than social and environmental interests (Selby, 2006). The result is that the debate about what we should be sustaining has, for the most part, been cornered by the economists (Dobson, 1996). In this sense, it can be argued that the tripartite nature of the ESD

language serves as a slogan system (in a similar way to the tripartite language of environmental education) to sustain environment-related educational practice that is not necessarily in the best interests of the environment.

Conclusion

Institutionalised language becomes very powerful, especially when the institutionalisation is conducted by an intergovernmental agency of such high visibility as UNESCO. Like EE, ESD may operate as a slogan system. These slogans actually invite, support and justify several interpretations, the effect of which is self-justified and field-justified continuity of practice. Ironically, a focus on the intersection of interests that is allegedly distinctive about ESD also presents a problem for this field of environment-related work. A problem with the descriptor 'education for sustainable development' is that it can serve as a slogan that is capable of supporting several interpretations. The idea of 'sustainability' itself is a comforting one for most people; it suggests a continuation of living conditions, however we value these. At the very least, this slogan may be interpreted as promoting any or all of ecologically sustainable development, socially sustainable development, or economically sustainable development. However, it is likely that the form of ESD most commonly enacted is economically sustainable development.

In the re-badging of environmental education as ESD, we have a situation in which individuals in the field are invited and encouraged to engage in environment-related work, and may take on the legitimating language of the field in doing so in any of a variety of ways. ESD proponents find an opportunity to critique existing environmental education practice in terms of the language of ESD, and yet also find justification for promotion of economic sustainability in terms of the new language of the field, thus wittingly or unwittingly becoming part of the 'problem' (if it is constructed as such) of failing to fully engage the pressing environmental issues of the age.

What this analysis suggests is that the challenge for research in ESD is to produce instances of ESD practice that address environmental, social and economic issues without privileging economic interests and in a way that is qualitatively different from the practices of EE. It is insufficient for the warrant for ESD is to be based on a comparison of ESD language with environmental education practice.

So what is the problem with the aggressive re-badging of EE? It is the problem spoken of by Popkewitz – that the slogans can be used to justify a lot of activity at the levels of language and organisation without actually leading to any real or lasting change. There is a danger that ESD will not lead to an improvement of environment-related education. This is the lesson from environmental education – that when there is a slogan system operating, there is every chance that change will be symbolic only. The language itself will enable a continuity of established practice: resources will be expended, careers developed, associations formed, journals filled – and environment-related practice will not necessarily change for the better. The challenge for ESD is to promote ESD practice in schools and elsewhere that is qualitatively different from established environment-related practice and that is more balanced than ecologically sustainable development. There is a clear challenge here for research in ESD – to make a proper case

for ESD by demonstrating the distinctiveness of ESD practice, and to thereby provide some empirical basis for the UNESCO assertion that ESD 'is more than just a slogan'.

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Think Piece
Education, Environment and Sustainability

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Introduction

The appearance of environmental issues in the epistemological horizon of scientific disciplines has constituted a veritable revolution, in the same way as linguistics gave a new sense and created new subject matter in the social sciences in the middle of the 20th century.

The study of the environment in its connotation of 'Nature' has been part of school curricula and scientific research for a very long time. The qualitative difference in how environmental issues are now dealt with in education and scientific research has been influenced by, on the one hand, the momentum gained by environmental issues resulting from industrialisation, followed by globalisation. Industrialisation and globalisation have revealed a previously unheard of magnitude and complexity of environmental issues, two aspects that due to the type and depth of knowledge available previously, had not been adequately pondered. On the other hand, the political, economic, social and even philosophical (ethic, aesthetic, epistemological, ontological, etc.) dimensions now associated with environmental phenomena have gone way beyond what could have been expected when the first critiques and cries of alarm about environmental issues were raised. These early warnings on the methods of increasing productivity (Rachel Carson); the models of industrial production and occidental lifestyles (Barry Commoner and Fritz Schumacher); the loss of and tragedy of the commons (Garrett Hardin); and exponential demographic growth (Paul Ehrlich and Donella Meadows), are only a few of the better known (not in chronological order).

Environmental problems such as we know them today started to manifest themselves with clear resonance during the years following World War II: the initial concerns were smog, acid rain and water pollution with emphasis on their impact on human health. These concerns gradually spread more widely during the 1950s, independent of people's and countries' ideological and political affiliation. Thus, both capitalist and socialist countries were victims of the effects of air and water pollution, of toxic waste and materials, and the general decay of the environment. This led to the emergence of political parties such as the Green Party in Germany and England (Rudolf Bahro, Petra Kelly and Jonathon Porritt); to new economic models and their corresponding scientific 'subdisciplines' such as ecological economics, environmental economics and the economics of steady state (Herman Daly, Joan Martínez-Alier, David Pearce, Robert Constanza); wide-scale social projects such as bioregionalism (Kirkpatrick Sale) and eco-development (Maurice Strong and Ignacy Sachs); lines of thought and action such as social ecology (Murray Bookchin), eco-feminism (Vandana Shiva) and environmental education

(William Stapp and John Smyth); ethical and philosophical proposals (Arne Næss and Aldo Leopold); and environmental institutions and regulations, among many others.

In summary, it is impossible in an article such as this to even attempt an archaeology of the multiple and diverse influences that the environment has produced in contemporary life as a whole. The goal here is just to set a context for the idea that sustainable development is one of the outcomes of an already long process of analysis and construction of alternate policies and proposals that face the recurrent environmental crisis that defines the contours of this historical moment. Certainly, sustainability does not refer only to the environmental dimension, but it is also true that the proposal of sustainable development can be better understood as a product of the discussions about environmental problems, although different streams of thought in the concept of sustainable development are closely knit. In fact, it was the words of the World Commission of Environment and Development, headed by Gro Harlem Brundtland, captured in the report *Our Common Future* (WCED, 1987; also known as the Brundtland Report) which started the widespread use of the concept of sustainable development, clearly showing the roots of the term in relation to the emergence of environmental concerns.

'Sustainable' has a dynamic connotation 'to keep going continuously, endure without giving way'. But very soon there was an emphasis on time (that is why in French it is translated as 'durable') linked with vital processes 'to keep in existence, support vitality as long as possible'.

Defined in the Brundtland Report in intergenerational terms, as development which allows for the satisfaction of the needs of current generations, without compromising the capacity for future generations to satisfy theirs, sustainable development has been the subject of complex debates. These debates locate it as a significant contribution to both political and academic discussions. Thus, we find configurations reflecting a positive sense that sustainable development provides a 'horizon of civilisatory potential' and other configurations that reflect a more negative sense of sustainable development as a myth of the 'business as usual' neoliberal technocracy. Here I will deal with both configurations, for they are inextricably linked.

Sustainable Development

Independently of several hundred definitions, sustainable development constitutes a proposal for the interdependent articulation of environmental conservation, social equity and economic growth.[1] Despite this intention, and despite numerous examples that show how this interdependent articulation is possible, and that sustainable development has potential to be meaningfully located in a basis of environmental, economic and social issues, politics and priorities in the wider social context are now forcing a recognition that in the sustainability thesis economic criteria have come to prevail over the other two.

In 1980, the World Conservation Strategy of the International Union for the Conservation of Nature and Natural Resources (IUCN) established that development in its relation to nature should start from a critical consideration of the way in which humans were modifying the biosphere, in relation to the satisfaction of human needs and the betterment of quality of life (UICN, PNUMA & WWF, 1980). A decade later, in the second World Conservation Strategy entitled *Caring for the Earth* (IUCN, UNEP & WWF, 1991), sustainability is defined as the

betterment of the quality of human life without exceeding the capacity of the ecosystems that give it sustenance, and it establishes that to attain sustainability, people must live according to the following principles, which later were taken up and synthesised by the Earth Charter:

- Respect and the care of the community of living beings
- Betterment of the quality of human life
- Conservation of vitality and diversity
- Minimisation of deterioration of non-renewable resources
- Keep within the limits of carrying capacity
- Modify personal activities and practices
- Train communities to take care of their own environments
- Establish a national frame of reference for the integration of development and conservation
- Forge a world alliance (IUCN, UNEP & WWF, 1991: 9–12)

It is not difficult to see that in this conceptualisation of sustainable development there is more weight given to ecological factors. Thus, in this framing, sustainable development is a function of the characteristics of ecosystems and depends on the type and intensity of human activities which take place in them, and thus the notions of capacity for change and resilience of the system become fundamental.

From the economic perspective, Herman Daly (1973) argued that the conditions of sustainability imply assuring the existence of the human species for the most prolonged period possible. He argued that under current conditions, sustainability would only be feasible with a zero population growth and a stable or zero-growth economic situation. Daly also affirms that sustainable development – not growth – supposes an administration of renewable resources that is subjected to two principles: the rates of collection must be equal to the rates of recovery (sustainable production), and the rates of residue emission must be equal to the natural capacity of assimilation of the ecosystems where those residues are let out. Non-renewable resources, he argued, must be managed in such a way that their rate of utilisation is limited by the rate of creation of renewable substitutes. Other factors, such as the technology or the scales of the economy, must also be harmonised with sustainable development.

From a social point of view, Mooney (1993) defines sustainability in terms of quality of life, in which human needs and aspirations can be satisfied without altering ecological integrity. This view of sustainability implicitly includes a sense of time, for such levels of satisfaction must be met for an infinite period. The social component has incorporated concepts such as environmental justice regarding the equitable distribution of the benefits and costs of development among different social groups, independently of their economic, cultural, religious, ethnic and racial conditions. The social perspective is also credited for incorporating cultural issues in the discussion of sustainable development.

The three aforementioned components of sustainable development – ecological, economic and social – are dealt with as a whole in different combinations; for example, the Plan of Implementation which came out of the World Summit on Sustainable Development (Johannesburg, 2002) sets out that: 'Poverty eradication, changing unsustainable patterns of production and consumption and protecting and managing the natural resource base of

economic and social development are overarching objectives of, and essential requirements for, sustainable development' (Introduction, 2nd paragraph).

One of the critiques of sustainable development discourse has been related to the problems of communicating the aforementioned conceptions simply and clearly to the general population. Efforts to address this critique have led to the emergence of more operational definitions, which, in terms of political decisions, have included some relevant exercises in this direction.

Several strategies and procedures have been proposed to assist people to determine whether we are headed towards sustainability. For example, we find that cost/benefit analysis, life cycle analysis, and studies of load-bearing capacity, among many others, have emerged. However, little consensus has been achieved because it is difficult to establish specific criteria and ways of measuring and making operational the general concepts in specific cases and situations, even if there is an ongoing search for such criteria and indicators.

Forman (1990) has proposed a model to measure the transition towards sustainability on the basis of an Ecology of Landscape, on the basis that this can only be evaluated when long periods of time have passed. In this way, it is possible to see whether landscapes change or remain relatively stable against two sets of variables: those which characterise ecological integrity (soil, biological productivity, biodiversity, water and oceans) and those which characterise basic human needs, such as food, water, health, housing, fuel, social cohesion and cultural diversity. This author posits that knowing human aspirations we can construct scenarios of possible alteration to the landscape, since the changes of variables of soil, biodiversity, etc. are slower and easier to establish. To get closer to sustainability we must then achieve a stabilisation in these basic variables, so that landscapes are sustainable in the long run (Salinas & Middleton, 1998).

Other approaches to try to implement a sustainability index can be seen in *The Wellbeing of Nations* by Prescott-Allen (2001). This is a report constructed on the basis of surveys in 180 countries, utilising an average index called a sustainability barometer which is composed of two indices that are considered equivalent, each with their corresponding indicators (Table 1).

Table 1. The two indices and their corresponding indicators used to calculate the Barometer of Sustainability (WI)

(A) Human Sustainability (HWI)	(B) Sustainability of Ecosystems (EWI)
Health and population (2)	Soil (5)
Wealth (14)	Water (20)
Knowledge and culture (6)	Air (11)
Community (10)	Species and genes (4)
Equity (4)	Use of resources (11)

(Source: Prescott-Allen, 2001)

Both indices intersect to estimate the Barometer of Sustainability (WI); at the same time, this methodology determines what is called the Wellbeing Stress Index (WSI) which refers to the damage caused by society in attaining its development. In the resulting scales the minimum score required to reach sustainability is 81, where the best-positioned countries are Sweden (64), Finland (62.5), Norway (62.5), Iceland (61.5) and Austria (61). The USA is in place 27

with 52 points (73 [HWI] and 31 [EWI]) and Mexico in place 150 with only 33 points (45 [HWI] and 21 [EWI]). This implies that no country can consider itself sustainable and all are far from being so. In addition, this methodology does not take the international effects of the wellbeing index into account, and excludes data which are considered in other methodologies, such as that of ecological footprinting (Wackernagel & Rees, 2001).

Given the methodological complexity inherent in the concept, sustainable development is not taken as a predefined, unmovable goal in space and time, but rather as a process to advance civilisation in a new direction with a growth model that is equitable and which takes adequate account of the long-term conservation of the quality of the environment. Three additional positive elements can be derived from the debut of sustainability on the international scene:

- First, it has gradually made it clear that natural resources are not an unlimited capital for development but that, on the contrary, they are a limiting factor for it (Foladori, 1999)
- Second, it has strengthened, though still incipiently, politics of eco-efficiency, cleaner production and recycling, giving strength to scientific research and technological development in related areas, and even promoting new disciplines constructed at the interface of previously separate disciplines such as agroecology, ecological economics, bioethics, socioecology, etc.
- Third, it has allowed for a renewed debate on policy and styles of development, social equity and respect for differences which had gradually diminished with the Cold War, and as the thesis of neoliberal conceptions centered around the notion of a free market gained rapid prominence as the preferred policy and development driver following the end of the Cold War

Critique of Sustainability

There have been a range of diverse critiques of the concept of sustainable development. For example, there has been critique of the formulations stated in the Brundtland Report which demand a compromise and concern for future generations, when large numbers of the current generation are not yet able to satisfy their own needs (Bifani, 1992). Besides this, there are numerous questions related to the vagueness of the Brundtland definition of sustainable development. What necessities? How many generations? In fact there are those who affirm that it is precisely the lack of precision of this definition that elicits such a wide consensus and diverse following of the term 'sustainable development', since it has the potential to respond to the necessities of each discursive configuration.

Even the referents of ecological notions defended by other definitions such as as the concept of carrying capacity have been questioned because they refer to animal populations that an ecosystem can give territorial sustenance to, not considering the enormous variability of exosomatic consumption among individuals, social classes and countries, an inequality that is not reducible to biology because it has cultural aspects too (García, 1999:8). Thus, it is not possible to apply the concept of carrying capacity to human populations, without an appropriate approximation of what constitutes a minimum of acceptable wellbeing for all the world's populations. The Millenium Development Goals tried to establish a basic platform

to describe the needs of the poorest and most disadvantaged segment of society, but these minimums are obviously unacceptable if one takes the whole population into account. Why, for example, should only half of the world's hunger be reduced and not all? Furthermore, the world is not moving towards a fairer distribution of the benefits of development. According to the UNDP (PNUD, 2005:40) 'If extreme groups are measured, the gap between the average citizen of the richer and the poorer countries is enormous and continues to grow.' In 1990, the average American's income was 38 times larger than the income of the average Tanzanian citizen. Today the average American is 61 times richer than the average Tanzanian, despite massive economic growth and a global increase in poverty reduction policy and discourse.

But not only poverty is growing. According to the Millennium Ecosystem Assessment (MEA, 2005) the amount of water drawn from the rivers and lakes for irrigation, domestic and industrial use doubled in the last 40 years; from 1980 to date approximately 35% of mangroves have been lost and 20% of the coral reefs of the world have been destroyed and another 20% have been seriously degraded or destroyed. But the economy and consumerism have grown to levels never seen before.

This is why, from the beginning, many critiques of sustainable development have been directed against the noun 'development', considering that sustainable development is a largely self-indulgent phrase, due to its link to economic growth and with semantic overtones suggesting the failure of developmental policies. This explains why many prefer to speak simply of sustainability.

As I see it, the emergence of the paradigm of sustainable development has been one of the factors that have contributed to a weakening of ecological policies. A sad paradox, since, as we said before, it was in the context of deliberations regarding environmental issues that this notion was coined. The conjunction of economic, social and ecological factors in one concept sends us again to the old conflict of establishing priorities in public policies. It is the dilemma of the chicken or the egg. Resulting from the political space created by this debate for dominant (economic) interests to triumph, serious environmental public policies are once more being postponed, both at global and national levels. In the face of problems of unemployment, insecurity and poverty, environmental issues are no longer at the forefront of public policy, as if these issues are not closely interdependent, and as if they do not need to be faced simultaneously. It is the antagonism of what is apparently more urgent and important that seems to win the day, especially when electoral times approach within political models that are constructed according to short-term electoral (and associated economic) gains.

In comparing the arguments used in perspectives of ecological sustainability *versus* socio-ecological sustainability, I will rely here on the work of García (1999), who illustrates how the rigid criteria of ecological conservation become more flexible or relative when considerations of ethics, justice and politics are introduced (Table 2).

Table 2. A comparison of the criteria used to describe ecological sustainability vs ecological and social sustainability

Ecological Sustainability	Ecological and Social Sustainability
1. The extraction of renewable resources must be equal or inferior to the capacity of the natural regeneration of ecosystems and the emission of pollutants must be kept within the limits of the natural capacity of assimilation. 2. The extraction and consumption of non-renewable resources must be as slow as possible, consuming preferably more abundant renewable substitutes; and the emission of pollutants must be kept within the limits of the natural capacity of assimilation. 3. Technological change must be oriented to increasing the service rendered by every unit of natural resources consumed, and to extending the substitution of renewable for non-renewable resources. 4. The physical scale of economics must be kept within the capacity of sustainability of the ecosphere.	1. The desirable level of exploitation of renewable resources is equal or inferior to the capacity of regeneration/assimilation of ecosystems, as long as this allows for the satisfaction of needs deemed sufficient and acceptably equitable. 2. Adoption of a desirable rhythm of depletion of non-renewable natural resources, that is, a slower rhythm compatible with a level deemed sufficient of satisfaction of human needs and with an acceptable degree of fairness and equitableness in its distribution. 3. Technological change must be oriented to increasing the service rendered by each unit of natural resources consumed, and to extending the substitution of renewable for non-renewable resources, in the setting of acceptable and equitable levels of consumption. 4. The physical scale of economics must be kept sufficiently under the capacity of sustainability of the ecosphere so as to provide flexibility to social evolution, which is unpredictable.

(Source: García, 1999:32–38)

It is increasingly evident that sustainability jargon has become little more than a means of more sophisticated political and institutional discourse, a case of wishful thinking, a rhetorical excess which has been unable to modify the course of the objective process of development, in what pertains to decision making and distribution of power. This was being done by environmental policy, but it is this kind of policy precisely which is currently at risk of losing its place in national and international priorities. Sustainable development, says Reigota (2002:192), grew in popularity because it is a *cliché* that is closely linked to theoretical comfort, a notion that became familiar and took on 'common sense' status among the scientific, political and economical international *status quo*.

Gross (2002:23–30) introduces the consideration that in the face of so many discrepancies regarding terminology, in the scales that are used, as well as the fact that analysis and definitions rely on territories and physical spaces at different levels of aggregation, we must ask ourselves whether sustainability is possible for society as a whole, and how valid sustainable development is for the poorer sectors of society. In addressing these questions, García (1999:8–9) responds that 'conditions to ensure the sustainability of a society cannot be established theoretically. The most we can do are evaluations of the sustainability of determined social practices over others.' The discourses on sustainability of human society, including those of a more technical nature,

rely on foundational narratives of the style of myths and archetypes that underlie the deepest levels of culture.

Gudynas (2002:58–59) mentions that nowadays two important tendencies among the different conceptions of sustainable development can be observed. The first underlines economic components, specifically the notion of 'natural capital'. For this tendency, sustainable development implies keeping a constant total capital, adding up natural capital and the capital that results from human action. Gudynas says that this perspective is identified as *weak sustainability*, given that it admits the substitution of one capital for another, and it appeals strongly to traditional science, technocratic in nature and with low influence on politics.

The other tendency Gudynas identifies, *strong sustainability*, distrusts the substitution of one capital for the other and recommends increased utilisation of energy that comes from alternative (renewable) sources. In it, the environment is valued from multiple perspectives, relying on the concept of Natural Heritage that includes political issues, recognising in nature values that are its own, independent of its utility for human beings.

In this respect, Pierri and Foladori (2001) state that it has been moderate environmentalism, that is, weak sustainability, which has controlled international politics about sustainable development. But in this trend, affirms Naina Pierri, in giving preference to the technical dimension of the problem about what and how much natural capital to conserve and give greater importance to, that is, in giving preference to quantitative over qualitative issues, the social dimension gets raised only with a limited and unfair scope: that of reducing poverty inasmuch as it is responsible for environmental issues.

This is consistent with the results of a study of sustainability in Latin America and the Caribbean (Bárcena & Sánchez, 2002:19–20). This study affirms that in the decade leading to 1999 the region underwent a demographic transition and a progressive aging of its population. Poverty was reduced in relative terms, but the creation of jobs was slow and the level of inequality grew larger in many countries. There was progress in matters of gender equity, since the participation of women in the job market grew. Different important social policies were put into action in different sectors, even though it was evident that the incapacity for economic growth to satisfy the social need of sustainability was due more to the style of development – and the patterns of production and consumption it engenders – than to the annual rates of growth as such. This indicated that the historical patterns of accumulation in the region have not been successful in modifying the social asymmetries they produce, including during periods of fast growth. This demonstrates, once more, that beyond the imperatives of growth in the short term, it is urgent to put in place structural changes in the styles of development that exist in the region.

Seen this way, the institutional discourse of sustainable development seems to be more of the same, seasoned with an apparent integration of policies, even though seen by the set of governmental sectors as being within the jurisdiction of the environmental sector, which is the result of the process of construction of public policies on this matter. In this way, the sustainability of development, anchored in neo-liberal economic criteria, is paradoxically and ironically conceived as a policy that is more applicable to the environment than to society or the economy.

Several authors (e.g., Azuela, Carabias, Provencio & Quadri, 1993) report that sustainable development has been adopted by diverse visions and conceptual frameworks, which make the original problem more complicated. Initial formulations were not based on a conceptual elaboration that integrates them, but have rather adopted normative criteria to be fulfilled by the new strategies. That is why the framework has conceptual deficiencies as much in the economic perspective (difficulties to give economic value to nature; to determine the price of the component of the environment; to establish accountability systems for economic-environmental issues; to re-elaborate fiscal policies; to control externalities with efficient instruments and mechanisms; among many others) as in what pertains to the environment (the lack of an adequate framework for the integral management of natural resources; the lack of understanding of the ecological basis of traditional and modern technologies) or their interactions (lack of precise knowledge of the interaction between ecosystems and populations, poverty and environmental deterioration, for example). After more than a decade of the critique of these deficiencies, they are still present.

Closing Remarks about Education

Linked to the arguments that have been provided here, and in spite of the inherent complexity of this discussion, it is assumed that through education the social will and capacity to modify ways of life and civilisation that are in harmony with nature can be achieved. This naïve position overlooks or ignores the issue that the main reason for the current lack of symmetry and equality in the world derives from a pattern of distribution and enjoyment of the resources and wealth of the world that is intrinsically unfair, immoral, rapacious and criminal. What education *can* contribute to is putting a spotlight on this curtain, and it can develop capacities to deconstruct the trends that hide or distort the social order that underlies dominant discourse on the sustainability of development.

The 30 years after Tbilisi that we commemorate this year must be a turning point to give way to new and more fertile approaches to the programme, a new epistemology must be constructed, notwithstanding that there is already a heritage of thought around environmental education that cannot be erased by institutional mandate. There has been a substantial endeavour over the past three decades to contribute to 'liberate the world' through environmental education. It seems, however, that we have obviously fallen into numerous errors of interpretation and of action, but the goals that set us going are still alive, and we have constituted ourselves as a community that keeps fighting, in spite of the inherent obstacles to our task in a world that moves in the opposite direction due to suicidal and egotistic motives that we can more clearly identify now. It is a good moment to renew the bonds that unite us and strengthen our commitment to our common goals.

As the *Programa Centroamericano de Capacitación Interna* (WOLA, 2005) affirms, political action brings together the efforts of organised citizenry to shape the formulation and implementation of public policies and programmes, through persuasion and pressure with authorities, international financing organisations and other institutions of power. That is, they are activities directed to gaining access and influence over the people who have the power of decision in vital matters

for a group in particular or society in general.

This means that political action is a tool that can be used to strengthen the real participation of citizens in the decision-making processes of government or other powerful institutions. Involving different sectors of civil society in advancing their agendas so that they have an impact on public policies through participation in a democratic and systematic fashion in making the decisions that affect their lives is a way forward. Thus, we need to give new life to a new cycle of environmental education in which political action, with the explicit purpose of consciousness raising and citizenship education around the quality of the environment, is more prominent.

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Endnote

1 UNESCO has promoted a fourth dimension of sustainable development, culture, and this allows for emphasis on cultural diversity, and therefore different outlooks on development.

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Think Piece
Research in a Changing World: Normative questions and questions that matter

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Introduction

Happily this is a good time to reflect on research in environmental education. It is symbolically important, 30 years after the Tbilisi Declaration (UNESCO-UNEP, 1978). It is timely in leading up to two major world conferences, the 4th World Environmental Education Congress in Durban, South Africa, and the Tbilisi+30 Conference in Ahmadabad, India. And, importantly, it feels like a geopolitically opportune time to reflect on research directions in this field, as issues like climate change and socio-environmental justice shift from the periphery towards the centre of public interest.

Environmental education research has had periods of intense debate, and, to some extent, these have led to changes in direction – or, at least, widening of opportunities. To me, this has been a little reminiscent of Thomas Kuhn's (1970) reflections; when sufficient anomalies emerge, rapid change can occur. Deeply held assumptions are revealed, challenged, and replaced. In environmental education, the phenomenon isn't quite as tidy as this, and the story can be told in a number of ways. I don't think we can go as far as to say that old assumptions have been replaced. But, it does seem reasonable to trace the widening of research possibilities and some twists and shifts in research priorities.

The story developed in this paper draws on, what seem to me, to be three key clusters of ideas and events, presented as vignettes. They are chosen for their collective heuristic qualities. They celebrate some considerable successes in contesting once-dominant research traditions and reflecting on emergent methodologies in a context of transformation. They also point to what I think are urgent research priorities to engage in normative questions in environmental education. There are other ways to tell this research story; this is my interpretation of some of the many events of the past 30 years.

Contesting Paradigms[1] in Environmental Education Research

The title of this section takes its name from a research symposium held at the 1990 North American Association for Environmental Education Conference in San Antonio, Texas. During the period leading to this symposium, tensions had increased in the research community about the viability of much environmental education research, and what counted – or was counted – as research. An increasing number of researchers had been raising challenging questions (i.e., Robottom, 1987; 1993; Jickling, 1989; 1993; Gough, 1993; Hart, 1993; Wals, 1993a).

These questions were anomalies to 'perceived wisdom' at the time as reflected in, for example, the editorial policies of the *Journal of Environmental Education*. This perceived wisdom was summarised in the symposium proceedings by John Disinger (1993) who said, 'Education is a behavioral science; as such, it is far behind the exact sciences in development of empirically demonstrable theories or in ability to exert control over observable events' (p.22). Yet, as Arjen Wals (1993b) retorted, 'What you can't measure still exists' (p.12).

In a systematic analysis of the situation, Ian Robottom (1993) argued that the positivist research most dominant in environmental education in 1990 was also strongly behaviourist. And, as an ideology of positivist environmental education research, 'as expressed in the North American Association for Environmental Education', behaviourism 'prefigures our perceptions of the relationships between teachers, pupils, subject matters, and educational settings' (p.134). For Robottom, an important step in broadening conceptions of research was to more critically reflect on the implications of adopting a behaviourist research orientation. First, he (and others) argued that the inherently deterministic nature of behaviouristic research is at odds with educational goals such as critical thinking. Second, it sustains a division of labour between researchers and practitioners. Third, it imposes the researchers' environmental, educational and social values onto pupils in a way that is disempowering.

Robottom (1993) also argued that non-behaviourist research differs in its critical and self-conscious interest in explicating the interpretive categories of practitioners – or partners in the research. These include the aspirations, assumptions and values tacitly or consciously held by these research partners, and in terms of which their educational actions can be made intelligible.

There seem to have been a number of outcomes arising from this volatile, and sometimes painful, period in environmental education research. For many researchers, there was a greater critical awareness of methodological assumptions and their implications as reflected in dissertations and publications. There was a rapid increase in the number of available research journals, including *Environmental Education Research* (1995) and the *Canadian Journal of Environmental Education* (1996) in English, *Éducation Relative À L'Environnement – Regards, Recherches, Réflexions* (1998) in French, and *Tópicos en Educación Ambiental* (1999) in Spanish. Among them, the *Canadian Journal of Environmental Education* was explicit in its aim to broaden the conception of what counted as legitimate research in environmental education. There was also a notable book by Robottom and Hart (1993), *Research in Environmental Education: Engaging the Debate* that served to continue the conversations brought into focus at the 1990 symposium. Behind all of this, I think it is fair to say, was a need to find ways for researchers to pursue questions that mattered. This has been made difficult, methodologically, by a privileging of behaviourist research.

Research Design in Contexts of Transformation

The next time period I find interesting is roughly framed by the late 1990s and early 2000s. Widening the scope for research (and continuing do so in ongoing ways) was an important step. But, some methodologies were 'out of the blocks' a little faster than others, and with

good reason. They were very appealing in contexts of transformation such as South Africa. In particular, participatory action research provided a powerful counterpoint to the previously dominant (and still significant) positivist discourse. So powerful was this new narrative that I attended a PhD thesis proposal presentation in South Africa in 1999 that accepted it as a given – 'of course I will be doing participatory action research'.

Heila Lotz-Sisitka (2002) has reflected on her own experiences during this period in South Africa. Her story begins as a PhD student in the early 1990s, just following the intense contestation described above and during the immediate proliferation of what she described as the '"then powerful" international environmental education research paradigmatic frameworks' (p.110), or 'alternative paradigms' (Mrazek, 1993; Robottom & Hart, 1993). She goes on to suggest that during this period these framings were often presented by research advisors as options to guide methodological choices.

For Lotz-Sisitka (2002) this was a time in South Africa where critical intellectual traditions won the space to argue for redress and social transformation and when participatory action research was viewed as transformative, emancipatory, and socially critical. Accordingly, she describes making decisions influenced by the 'critical paradigm in environmental education research' (p.110), and the power of this research paradigm within the academy. She also looks back to her thesis work of 1996 and reports that for the purposes of her study 'a comparison or argumentation of these paradigms was not deemed necessary. A decision was made to *contextualise the choice to work within a socially critical framework, and to justify this choice*' (p.111). In this wonderfully candid reflection, Lotz-Sisitka describes the all too common phenomenon of making research decisions first and justifying and contextualising them later.

Throughout this process, however, she was clearly concerned about imposing a large-scale, manufactured-elsewhere, framework on her research design (Lotz-Sisitka, 2002). Through the balance of this extraordinarily insightful paper, Lotz-Sisitka describes her ongoing reflections throughout the research process, and subsequently as a research advisor. She traces her dissonance with her chosen research process, and questions its transformative value. She also describes shifts in her research orientation during later stages of her study as she responded to her own questions. I recommend reading the paper in its entirety.

In my interpretation of this paper, I see some key points – maybe even lessons – that may help to inform research in our evolving field of environmental education. First, this story describes the power that the academy can bestow on favoured practices. Earlier, I described influences of a behaviourist research orientation. And now, this story describes the immediate (and in many ways important) response to a crack in the grip of this research orientation. While other research frameworks found new space to develop, participatory action research became a particularly powerful (and in many ways welcome) counterpoint to behaviourism. This story can also alert researchers to how easy it may be to succumb to trends, especially when methodologies are chosen first and justified later.

Encouragingly, Lotz-Sisitka (2002) describes growing breadth in methodological decisions within her own university's programme. She reports a continued interest in participatory action research, but also in interpretive processes to reveal insights into educational processes and practices; post-structural inquiries that hope to reveal silences, textures, and insights

of indigenous knowledge in/as environmental education processes; and, examinations of epistemological tensions inherent in contextual practice. More recently, Lucie Sauvé (2005) describes a tentative framework of 15 extant currents in environmental education research. It seems to me that an early goal of broadening what counts as research in environmental education research has achieved some success.

The second important point that I take from the Lotz-Sisitka (2002) paper is her shift in emphasis from methodological choice to research decisions. By this she means that environmental education researchers have the task of developing contextually relevant research frames. As supervisors, their task may include reflexive and contextual co-construction of research frames. At the same time, she suggests they have a second responsibility to make sure that these frames are not adopted on an industrial scale, that is, as new paradigms to replace old, or Western, ones. Making research decisions means that methodologies grow out of contextual realities and burning questions. The horse is returned to its place in front of the cart.

Finally, Lotz-Sisitka (2002) offers additional thoughts that are, I think, harbingers of emerging themes that may develop into another important story in environmental education research. Drawing on work from Gough and Popkewitz, she reminds us that educational inquiry needs to move beyond reflection and reflexivity towards actually making a difference in the world – towards liberating the consciousness of people considering their human conditions within their environmental and social contexts.

In 1990 it seemed impossible, to me at least, to address many important questions when research respectability was defined so narrowly. Since then, there has been much methodological liberation. I hope this continues. But, I wonder if environmental education research also will need to engage more fully with normative questions to realise its potential to make a difference.

Some Thoughts on Normative Questions

It is getting hot here on Earth. Forget images of tomatoes and cucumbers being nurtured in cosy greenhouses, things are really heating up (Lake, 2001). Climates are changing. While there is never absolute certainty in science, there is plenty of evidence to suggest that individuals, communities, nations and international organisations should be responding to this issue, as a measure of precaution and as a normative issue of justice – for current and future generations. Many are, but not enough. Recent mainstream media sources such as Al Gore's film *An Inconvenient Truth* identify this is a moral issue. Put another way, the venerable Norwegian Philosopher Arne Næss has said that we have more than enough science to know what to do (Næss & Jickling, 2000). The same can be said of many, if not all, environmental issues.

I agree that responding to environmental issues is necessarily a normative affair involving moral concern and hence environmental ethics.[2] In a context of heightened awareness and concern for environmental issues in Northern and Southern contexts [and the hybrid spaces in-between], I suggest that it is timely for mainstream inclusion of environmental ethics in education and educational research. However, education is itself a normative idea, and formulating an educational response to environmental ethics necessarily links these two concepts.

Education

The Earth Charter (Earth Charter Commission, 2000) provides one response to contemporary environmental concerns. David Gruenewald (2004) suggests that it provides a vision that 'can serve as a challenge to all educators, environmental or otherwise, to reexamine the purpose, context, and scope of their work' (p.95). However, educational responses to the Earth Charter are also contested (Corcoran, 2003; van Harmelen, 2003); I recall one southern African scholar responding to a presentation on the Charter with the suggestion that it sounded like another 'salvation narrative'. I find this example particularly interesting in that it seems to ask for understanding of both 'education' and 'ethics'.

Despite postmodern concerns about attempting to clarify conceptual understanding of normative terms (Hart, Jickling & Kool, 1999; Le Grange, 2004), the Earth Charter dissonance seems to invite such conceptual work. And, there are no political vacuums. A relative absence of dialogue about 'education', leaves the terrain open to other concepts. For example, Le Grange (2004) suggests that the rise of the language of learning now enables the re-description of the process of education in terms more like that of an economic transaction – with the learner as consumer and the educational institute as provider. Alternatively, he suggests, the language of education opens more space for complex understandings of the nature of environmental issues and for recognising that 'environmental knowledge is produced in interdependent and interactive relationships between teachers and learners who engage critically with information, issues, and problems often resulting in unintended outcomes' (p.139). His appeal to environmental educators is to re-engage with the language of education. Whether the Earth Charter provides a challenging vision or a salvation narrative for environmental educators will be dependent on individual and collective interpretations of education, and how the Charter is presented in educational contexts. That is, will it be presented as a transaction or as a complex phenomenon with uncertain and unintended outcomes?

It has long been acknowledged that education (and environmental education) is an essentially contested concept that has developed and changed over time and that suggests a fluidity of meaning that shifts across a range of contexts (Peters, 1973; Williams, 1976; Walsh, 1993; Jickling, 1997; Hart *et al.*, 1999; Gruenewald, 2004). There is a sense, in which the concept of education has been continually re-created, to work with an idea from Deleuze and Guattari (1994). And this may be a good time to re-invigorate that process. Before going on with this work, I will provide my own reading of possible relationships between analytic traditions (of many educational philosophers) and Deleuze and Guattari's meta-philosophy.

I think it is unfortunate that Deleuze and Guattari's (1994) description of philosophy as 'the discipline that involves creating concepts' (p.5) has been contrasted with work of many analytic and linguistic philosophers who have been described as more concerned with the clarification of concepts (Peters, 2004). While there can be multiple readings of this sentiment, at least one of these could be an 'othering' of the analytic traditions. At the least, it doesn't seem very rhizomatic. However, my own reading of Deleuze and Guattari suggests much more resonance with conceptual analysis (i.e., Wilson, 1963) than this contrast encourages, while at the same time, enabling expansive possibilities.

To begin, Deleuze and Guattari (1994) seem, in their wonderfully enigmatic way, to use the term 'create' in a number of ways. In the first and perhaps most literal sense, this involves the creation of previously unspoken concepts; 'Plato said that Ideas must be contemplated, but first of all he had to create the concept of Idea' (p.6). As they point out, philosophers have always done this. An example from contemporary environmental thinking is David Abram's (1996) term 'more-than-human', created in response to anthropocentric tendencies in the term 'non-human'.

In a second sense, Deleuze and Guattari (1994) speak about concepts remaining 'subject to constraints of renewal, replacement, and mutation that give philosophy a history as well as a turbulent geography' (p.8). In my reading, this strikes me as a welcome (and resonant) historical and geopolitical expansion of Wilson's (1963) methodology of testing an analysis against new information and hard cases. And, it is akin to what Le Grange (2004) is doing when he introduces, in the context of contemporary South African education, 'risk' together with 'unintended outcomes' as important components of education. Making this case, as he has, can be seen as an act of renewal (particularly when juxtaposed against possible replacement with the language of learning) and an act of creation.

In another sense of creation, Deleuze and Guattari (1994) talk about constructivism; 'Constructivism requires every creation to be a construction on a plane that gives it autonomous existence' (p.7). And, they say, 'you will know nothing through concepts unless you first create them – that is, constructed them in an intuition specific to them: a field, a plane, and a ground that must not be confused with them but that shelters their seeds and the personae who cultivate them' (p.7). They warn that philosophers have not been sufficiently concerned with the nature of the concept, preferring to think of it as a given. But, for Deleuze and Guattari, concept and creation are related; a concept is something that is to be created. This, I read, implies ongoing engagement, analysis, and creation of concepts as requisites to knowing through them.

Returning to Le Grange's (2004) example, I read his creation (analysis, or re-creation) of education, inclusive of 'risk' and 'unintended outcomes', as the kind of work that can help environmental educators engage with normative issues, and employ devices such as the Earth Charter, in ways that enable them to re-examine the purpose, context and scope of their work. It is also the kind of work that challenges environmental educators to make creation of central concepts a vital part of the philosophical reality of their field.

Ethics: Beyond the radical reduction of normative questions to relations of power

Critical theory remains a powerful influence in environmental education, so it is welcome to find concerns about normative issues being raised from *within* this body of literature. I read these like anomalies. For example, in commenting on poststructuralism, Delanty (1999) is of the view that 'this movement is now at an end, having largely accomplished its objective – the relativisation of identity and knowledge and the demonstration of the limits of the intellectual categories of the nineteenth century.' He adds that for the 21st century, 'it is no longer a question of attacking false universalisms but of overcoming relativism and the fragmentation of the social' (p.3).

Sayer (2000) argues that, 'The massive imbalance between sophistication of positive social science and the poverty, at least outside political theory, of normative thinking is intolerable …' (p.186). A key problem for Sayer comes from Nietzschean poststructuralism that reduces problems of justice and morality to simple problems of interest. He argues:

> Such a radical reduction is not sustainable: those who sneer at values and morality get as upset as anyone else when someone treats them improperly. Moral discourse is indeed sometimes little more than a camouflage or legitimation of power, often hypocritical; but again, a bad use of such discourse need not drive out a good use. (p.177)

For Sayer, considering ethical issues – concerning the nature of good and how people should treat one another – is essential to the examination of social sciences' critical standpoints and implicit normative stances.

Delanty (1999) does offer a way forward through the work of Bauman (1993) who brings a normative or moral approach to postmodernism. A key point for Delanty is that Bauman's work, rooted in a moral sensibility named an 'ethics of proximity', does not require universality, and does accept that we live in a world of uncertainty. Alternatively, Sayer (2000) looks to what he terms the 'newer feminist and green or environmentalist critical social sciences' where he perceives 'less of a gulf between the normative and the positive' (p.173).

Sayer's point is well taken, and provides a reminder that work on normative dimensions of environmental issues, or ethics, is proceeding in parallel on many fronts. For example, as Bauman (1993) was theorising about postmodern ethics in Europe, Cheney (1989) was working on a similar project, 'Postmodern environmental ethics: Ethics as bioregional narrative', within the context of North American environmental ethics. Likewise, scholars such as Warren (1990) and Plumwood (1991) were developing ecofemminist thinking around similar issues. In South Africa, Hattingh (1999) was also seeking 'creativity in the diversity of environmental ethics'.

Creativity has often been a feature in Weston's (1992) work around 'enabling environmental practice'. And Cheney and Weston's (1999) 'ethics-based epistemology' provides another potentially productive point of engagement. Dunlop (2002) brings an artistic and poetic dimension to normative inquiry. And, Noddings's (1992, 2002) 'ethics of care' has also provided inspiration for ethics research in environmental education (i.e., Mortari, 2004).

This brief appraisal of the changing thinking around normative issues, particularly in the fields of ethics and environmental ethics, is neither exhaustive nor free of my own geopolitical biases. Its aim is to be generative while, at the same time, demonstrating a growing and productive diversity of approaches.

A Few More Thoughts …

Critical theory remains a powerful and useful influence in environmental education. But, as Sayer (2000) points out, critical social scientists have been, at best, coy about talking about values. Yet, early in the 21st century normative questions are important, especially in the context of

urgent socio-environmental issues such as global climate change and growing inequity between geopolitical regions of the world. And, these are questions that matter.

I suggest that making progress in normative dimensions of environmental education will be aided by some congruency in thinking about both education and ethics, and particularly environmental ethics. How educators approach ethics will be shaped by how they conceptualise, or create for themselves, the concept of education and *vice versa*; they are in relationship.

If Lotz-Sisitka's (2002) reflections offer lessons from the past, they might include predilections for contextually developed approaches to normative questions in environmental education and research decisions that are responsive and diverse – and possibly outside of, and/or broadening of the influential critical theory discourse (see Jickling, 2005; Lotz-Sisitka & Schudel, 2007). Indeed, Sayer (2000) points researchers towards fertile ground in environmental ethics, eco-feminism, and associated fields of inquiry. I anticipate such diversity to be generative within environmental education, especially if we tell our stories with the kind of clarity that enables reflection and resonance across bodies of literature and practice.[3] And, I expect this may be one route towards questions that matter.

Notes on the Contributor

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Endnotes

1 There was some discussion about whether 'paradigm' was the correct word. Some readers of Kuhn thought not, while others believed that this could usefully be used synonymously with 'pattern, example, or model' (Disinger, 1993; Jickling, 1993). I have chosen to use 'paradigm' only where it was used by other researchers to avoid the possibility of overstating the nature of shifts and changes in environmental education.

2 Here I use environmental ethics in a broad way that is inclusive, for me at least, of environmental philosophy and environmental thought.

3 Some readers may liken this to rhizomatic thinking.

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Think Piece
Learning for a World Changed by Intergenerational Equity

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> Secure Earth's bounty and beauty for present and future generations.
>
> a. Recognize that the freedom of action of each generation is qualified by the needs of future generations.
> b. Transmit to future generations values, traditions, and institutions that support the long-term flourishing of Earth's human and ecological communities.
>
> Earth Charter Principle 4

Intergenerational equity, the ethic of responsibility among generations, is stated in the Earth Charter as the imperative to 'recognize that the freedom of action of each generation is qualified by the needs of future generations' (Earth Charter Commission, 2000:Subprinciple 4.a). Clearly, ethics call out for responsibility to those yet to come of age. Indeed, this is at the heart of sustainable development – to 'meet the needs of the present without compromising the ability of future generations to meet their needs'.[1] We believe that 'learning in a changing world' must pay particular attention to the ethical principle of intergenerational equity and to the dramatic demographics of an increasingly youthful population.

Second, it presents a powerful opportunity for society if young people can participate in positive aspects of life, such as culture, environment, governance, politics and commerce, to promote sustainable development. In order to do so, young people need the support of older generations in terms of appropriate policies, education, information, financial resources, and hope.

Young people have an enormous stake in the present and future state of the planet. For instance, through their lifestyles, they influence commerce and the media industry and shape the process of production, marketing, and consumption patterns of goods and services (UNEP/UNESCO, 2001). Since young people are also tomorrow's workers, entrepreneurs, parents, and political leaders, the policy makers know that they will greatly influence the future of their nations and global governance (World Bank, 2006).

Agenda 21 – the sustainable development blueprint for the 21st century – recognised in Chapter 36 that education, public awareness and training are critical for sustainable development, and that the participation and involvement of young people, alongside eight other major groups,[2] are essential in its implementation (United Nations, 1992). However, sustainable development – in its dimensions of environment, society and economy – remains elusive as the state of the planet continues to deteriorate with attendant consequences to human wellbeing worldwide (MEA, 2005). The United Nations Decade of Education for Sustainable Development (UNDESD), 2005–2014, provides an important opportunity to explore the role

of enhancing the involvement and participation of young people in sustainable development processes and environmental protection activities, and to consider how education can be used as a tool for confronting the enormous global and local challenges (UNESCO, 2004).

But how might such an important opportunity unfold? And how might we broadly advance intergenerational equity in environmental education?

We believe the wider context of the UNDESD – the problem of human development that leaves one billion people in extreme poverty, the daunting environmental destruction we face, and the challenge of the demographics of youth – must be taken seriously. The devastating effects of unsustainable development upon the poor, so many of whom are youth and children, must be alleviated. Especially necessary is the creation of youth development opportunities that are sustainable.

Our work in environmental education takes place in the context of a globalised economic order that creates increasing amounts of wealth and concentrates it in the richest nations and richest individuals. And here we want to draw concern to the extreme poverty and attendant suffering that characterises our globalised world – in particular the global South. The rich are getting richer and the poor are getting poorer – and to an extreme extent. As you read this, one billion people struggle for life, and 20 000, mostly in Africa and Asia, will die today of extreme poverty.

Our work in environmental education also takes place in the context of the rapid deterioration of natural systems that support life on Earth, and that are also critical for human wellbeing. The Millennium Ecosystem Assessment initiated in 2001 by Kofi Annan, former Secretary General of the United Nations, indicates that nearly two-thirds of the services provided by nature to human kind are in decline worldwide (MEA, 2005).

The United Nations Intergovernmental Panel on Climate Change has now noted in its rather conservative report that global warming can be linked to anthropogenic causes and that climate change consequences are likely to increase in the absence of human interventions to limit greenhouse gas emissions globally (United Nations Intergovernmental Panel on Climate Change, 2007). The anticipated devastation is coming decades sooner than expected, and this is a conservative report. There are those who say we have entered the period of profound human-caused climate change, loss of biodiversity, and breakdown of natural systems.

Much of the natural world and significant parts of the social world are in agony; young people face a diminished future. We believe it is essential to create openings for serious participation by young people in conferences on environmental education. Young people have the greatest stake in learning for a changing world and the most to lose in the future. We believe such engagement in the questions and process of how environmental education must adapt is an antidote to the alienation and ennui that so many youth now feel.

Taking seriously the wider context of environmental education – 'the changing world' – compels us to make significant changes in teaching and educational policy – 'the learning.' Learning in a changing world must be learning for a world changing to alleviate poverty, eradicate diseases, promote gender equity, protect natural systems, create sustainable employment, and enhance youth participation in all matters related to their diminishing prospects for sustainability.

We already have pioneering examples in the area of curriculum reforms in higher education. For example, Earth University in Costa Rica has designed a curriculum to match the challenges of agribusiness, and is therefore able to dedicate itself to producing a new generation of young people trained specifically to focus on improving the human condition through entrepreneurial activities.[3] We believe that the challenge of education is to outline operational specificity to the broad-based concept of sustainable development in a changing world.

We emphasise this wider context because we believe that, at this critical juncture in human history, we must put environmental education into the service of the poor, into the service of the natural systems upon which we depend, and into the service of the rightful aspirations of youth to sustainable livelihoods and enduring hope. It is therefore encouraging that the debate on how to bring educational research, training and outreach activities to the service of the regions and communities in which educational institutions are located is emerging in Africa (Juma, 2005). Even more encouraging are new and innovative learning models such as the Youth Encounter on Sustainability (YES), which encourages the sensitisation of students for sustainability questions, in relation to their own perspectives, disciplinary knowledge, and experiences while learning about specific areas of sustainability in an environment that allows for practical experiences (Baud & Diaz-Triana, 2004).

We would like to offer the Earth Charter as an inspiration for teachers and students, as a framework for education for sustainable development, and as a hope for moving toward increasing prospects for sustainability. The Earth Charter is a declaration of fundamental ethical principles for building a just, sustainable and peaceful global society.[4] It seeks to inspire in all peoples a sense of global interdependence and shared responsibility for the wellbeing of the whole human family and the larger living world.

The contributions to the substantive content of the Earth Charter were derived from a prodigious array of sources. These ranged from the global ethics movement to the sacred texts of the world's major religions, from international law documents to new thinking in the sciences of physics, cosmology and evolutionary biology. Extensive research was conducted in these fields as a preparation for the drafting of the Earth Charter. The Earth Charter Initiative has worked especially closely, and continues to work, with a number of indigenous peoples' groups. As a result, the worldviews of the first peoples infuse the document with traditional wisdom. Perhaps the other, most significant source is international law. This includes intergovernmental law, charters and treaties – over 70 in all. This also includes non-governmental declarations and peoples' treaties – over 200 in all. And it includes 50 international law instruments.

The Earth Charter Initiative involved the most open and participatory consultation process ever conducted in connection with the drafting of an international document. Thousands of individuals and hundreds of organisations from all regions of the world, different cultures, and diverse sectors of society participated over 13 years.

Education, with its powerful concentration of intellectual resources and privileged position in society, has a leadership role, indeed, a moral responsibility to seek ethical and practical answers to the economic, environmental and social problems caused by globalisation. Education, then, can take the lead in pointing the way toward an integrated vision of the challenges and the solutions. We believe that the Earth Charter, recognising as it does the

indivisibility of environmental protection, human rights, equitable human development, and peace, is a wholesome conception of sustainability that can assist education in its response to globalisation.

This brings us to education for sustainable development. The concept of sustainability is emerging as a critical principle not just in education but in business, economy, human development, and policy making. Indeed, we think it is the meta-narrative of the 21st century. To us, the essence of sustainability is intergenerational responsibility. Education for sustainable development is that which speaks to the fundamental and profound change that we must make from the present course of environmental, social and economic development in order to ensure a healthy and peaceful world for future generations – in order to ensure a hopeful and enduring future for younger generations.

But what might that mean in educational practice?

> UNESCO argues that our understanding of sustainable development, and approaches to education for sustainable development, should be inextricably linked with the ongoing Education for All initiative, the United Nations Literacy Decade 2003-2012, and the Millennium Development Goals... In addition, UNESCO asserts that education for sustainable development should not be equated with environmental education, but rather encompasses it and go beyond it, integrating the social and economic dimensions with environmental concerns. (Clugston & Calder, 2005:4)

UNESCO has an enormous challenge in making sense of such a complex agenda, even though the initiatives they are trying to bring together are related and complementary. Many in environmental education are struggling to define education for sustainable development. One such definition was composed by 35 participants from 17 countries at the Halifax Consultation in Halifax, Canada, 2005. We were but two of many at this gathering for the tenth in a series of global consultations held in connection with the Global Higher Education for Sustainability Partnership (GHESP) Resource Project.

Participants agreed that:

> Education for sustainable development is inherently interdisciplinary and carries context, process, and contextual implications. Content-wise, it encompasses ecological literacy; process-wise, it takes on multiple pedagogical techniques; and contextually, it is place-based. Education for sustainable development gets at the notion that the built environment, social environment, institutional environment, and natural environment serve as pedagogical tools in a learning community. Education for sustainable development connects mind, body, and spirit and is potentially transformative. It encompasses different ways of knowing, i.e., relational, reflective, and rational. (Halifax Consultation, 2005)

Our challenge, as environmental educators, is to arrive at a shared vision of the meaning of education for sustainable development and a practical agenda for achieving it (Clugston & Calder, 2005). The Earth Charter process, as well as the results of the various UN Summits in the

nineties: on education for all in 1990; on environment and development in 1992; on population and development in 1994; on social development in 1995; on women in 1995; and on human settlement in 1996, as well as the Millennium Development Goals in 2001 can help us do so, because they embody and articulate ethical values. In particular, we believe, environmental education must engender learning guided by an ethic that recognises the limits on present generations on behalf of generations to come. Guided by the Earth Charter, environmental education must also fulfill its 30+ years-long quest to, as the Earth Charter says so well, 'transmit to future generations values, traditions, and institutions that support the long-term flourishing of Earth's human and ecological communities' (Earth Charter, Subprinciple 4.b).

This and many other principles of the Earth Charter represent serious intellectual and cultural efforts to chart a course toward intergenerational responsibility and global sustainability. How we manage the problems of poverty, environmental destruction and youth will determine the quality of life on Earth. Environmental education, in particular, has a moral obligation to examine critically the changing world and to seek to move it in a direction that is humane, just, and sustainable. It is only through this that we can fulfill the four pillars of learning: learning to know; learning to do; learning to live together; and learning to be (UNESCO, 1996). The Earth Charter provides an ethical framework for this urgent task. We believe it can serve as an inspirational guide to learning for a world changed by intergenerational equity.

Notes on the Contributors

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In a forthcoming book, Osano and Corcoran are exploring the nexus of young people, education, and sustainable development. They seek to articulate an emerging theory of environmental education informed by Earth Charter ethics that emphasises the participation of young people in developing the principles, perspectives, and praxis of such environmental education. They are both active in the Earth Charter movement.

Endnotes

1 Brundtland Report (WCED,1987:8).

2 These are: (1) women; (2) indigenous people; (3) nongovernmental organisations; (4) local authorities; (5) workers and trade unions; (6) scientific and technological communities; (7) farmers; and (8) business and industry.

3 See Earth University Foundation, http://www.earth-usa.org/earth_university/curriculum.html.

4 Much of this language is from traditional Earth Charter sources developed over the years of describing the provenance, process, and intellectual architecture of the Earth Charter. It may be attributed to various authors including Steven C. Rockefeller, Chair of the Earth Charter Drafting Committee.

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'Pricing Nature at What Price?' A study of undergraduate students' conceptions of economics

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Abstract

This paper focuses on undergraduate students' conceptions of, and learning in, economics. Reviews in the field of environmental education research have made clear that insufficient attention has been paid to the question of learning. In particular, there have been very few empirical investigations into the process (as opposed to the outcomes). There has also been a failure by environmental education researchers to engage with learning theory. Furthermore, it has been concluded that little research conducted within the realm of social science has included issues that relate to the environment in comparison to research in the natural sciences. In the light of this situation, this paper reports findings from a research project on undergraduate students' learning in economics and environmental science, focusing in particular on conceptions of learning in economics. The results show that, among a group of 11 students entering a masters course on Sustainable Enterprising at Stockholm University, a majority of the students having a major in the natural sciences found economics to be challenging in various ways. All the students addressed the concept of 'price' as particularly challenging as it does not give 'accurate' value to nature and resources. The paper ends by discussing the students' conceptions of the subject and reflects on challenges for learning in general when topics and content are found to be in conflict with personal values.

Introduction

In the research on environmental education, natural science has been regarded as the most important knowledge domain and several studies have focused on students' understanding of natural scientific phenomena (e.g., Boyes & Stanisstreet, 1998; Ivy, Lee & Chuan, 1998). However, there is a growing number of courses, particularly in higher education, focusing on environmental and sustainability issues in disciplines such as business and economics, law and history. Outside the academia, economics relating to environmental issues and problems is gaining more and more interest. An example of this is the attention the Stern Review from the UK's economics and finance ministry received in the Swedish media when presenting the costs (an estimation of 5 000 billion euros) of global warming (Stern, 2006).

With some exceptions, little research conducted within the realm of social science has included issues and matters that relate to the environment (c.f. Torney-Purta, 1994, on students' conceptual understanding of politics and economics concerning environmental issues). In a recent review on learners and learning in environmental education, it was concluded that insufficient attention has been paid to the students' socio-political knowledge and understanding

in comparison to their scientific knowledge (Rickinson, 2001:307).

This paper focuses on the conceptions of economics of undergraduate students with backgrounds in biological and environmental education. First, previous research on students' experiences of learning and research concerning 'troublesome knowledge' is presented. Then the findings of a case study exploring students' conceptions of economics and the pricing of nature are presented. The paper ends with a discussion on challenges for learning in terms of cognitive, meta-cognitive and affective aspects.

Background

Research on students' experiences of learning in higher education has been evident for some 30 years. One of the basic research questions addressed is how students conceive of the learning situation and what aspects they see and attend to as significant and how these relate to prior experiences of learning (Prosser & Trigwell, 1999). The major issues investigated empirically concern students' different ways of approaching studies and the relation to learning outcomes (Marton & Säljö, 1976; Meyer, Parsons & Dunne, 1990; Prosser, Hazel, Trigwell & Lyons, 1996; Entwistle, 1998), students' perceptions of the subject matter and approaches to studies (Crawford, Gordon, Nicolas & Prosser, 1994) and different understandings of key concepts, such as 'price' in economics (Dahlgren, 1984). This research points to the fact that students' prior knowledge of key concepts, prior experiences and conceptions of the nature of the subject matter, and prior experiences of studies of that subject, are aspects that are evoked in a new learning situation.

Research on higher education in recent years has paid special attention to the knowledge content and domain-specific concepts that students encounter in the learning situation (Meyer & Land, 2006). In this research the term 'troublesome concept' is used, referring to concepts that make the student 'see things in a new way' and is, as such, transformative. Meyer & Land (2006) explain that 'a threshold concept is thus seen as something distinct within what university teachers would typically describe as "core concepts"' (*ibid*.:xv). But, more so, threshold concepts are often troublesome for students to learn, and Perkins (1999; 2006) describes 'troublesome knowledge' as being conceptually difficult, counter-intuitive or 'alien'. Foreign or alien knowledge is knowledge that 'comes from a perspective conflicting with our own' (Perkins, 1999:9). In the subject of economics, an example of alien knowledge is presented by Shanahan & Meyer (2006):

> It is not uncommon in introductory economics courses to encounter students who reveal their 'anger' or 'disbelief' in the approach taken by the discipline. They just don't 'believe', for example, that it is appropriate to put prices on say, wildlife, or that 'some' pollution may be acceptable if the benefit from the activity causing the pollution exceeds the pollution costs. This may be despite students agreeing that such approaches can serve to achieve objectives consistent with their original beliefs (such as wildlife preservation). In the extreme, such resistance to an 'alien' approach can result in the student withdrawing from the course. (p.104)

Another way of looking at what can be regarded as troublesome knowledge or concepts is the notion of *episteme* within different disciplines. Knorr-Cetina (1999), in studying the research practice of physics and biochemistry, describes these systems in terms of 'epistemic cultures', and, in the words of Perkins (2006), an episteme can be defined as a 'system of ideas or ways of understanding that allows us to establish knowledge' (p.42). Davies (2006) gives a description of economics, stressing the aspect of systems thinking, which also can be seen as the episteme of the subject:

> For example, the economist's conception of a system of interactions between idealised individuals and producers encourages the application of mathematics to formally model ultimate outcomes. Abstraction from the peculiarity of any one individual or producer is necessary in order to make it possible to examine outcomes from many interactions that do not simply replicate the outcomes that would arise from one producer and one consumer. (p.79)

The research on students' conceptions of the nature of knowledge has its origin in the much-cited work by William Perry at Harvard University (Perry, 1970/1999). The results from his longitudinal study concluded that students develop their understanding of knowledge in a scheme: from a view of duality of knowledge, being right or wrong, to a view of multiplicity, finalising in an understanding that knowledge is constructed in shared norms of inquiry and knowing. In the finalising phase the student comes to a notion of 'commitment', meaning that the student decides on a theoretical perspective or means of inquiry, for different reasons. Thus, the student makes a choice, and 'commitment' refers to an act of awareness.

The study presented here is part of a current research project exploring how students come to learn in a new field – environment or economics – depending on their educational background being in environmental/biological science, or business and economics.

Methodology

Interviews were carried out with 11 students who were in their first week of a masters course on Sustainable Enterprising in January 2005. As part of the course requirements, the students needed a degree either in economics or in biology, with a complementary of 30 ECTS points in biology/ecology or economics, depending on their chosen major. The 11 students included 2 students with degrees in economics, and among the remaining 9 students, 4 had studied different inter-disciplinary environmental programmes (environmental communication, ecological economics, environment and sustainability) and 5 had a degree in biology followed by courses in economics.

The following interview questions were posed:

- Why have you chosen this masters course?
- What is your professional and educational background?
  - If you have a degree in biology or environmental science, what was your experience when entering the subject of economics?
- How do you see the relation between economy and environment?

All students were interviewed individually, and with informed consent from the students all interviews were tape-recorded and transcribed in full. The analysis of data focused on the students' descriptions of economics and on their ways of studying and learning, with a particular emphasis on how the students talked about pricing nature. The results of the analysis, presented in terms of students' conceptions, draw on inferences made from an intentional perspective (e.g., Halldén, 1999; Halldén, Haglund & Stromdahl, 2007; Lundholm, 2003; 2004a; 2004b; 2005). This means that the students' interview answers must be considered as part of a social context. For example, the students' responses can be seen as forming part of a conversation with the interviewer, or as part of a test situation in which the student tries to give a 'correct' answer, or both. The idea of taking the social setting into account is to facilitate an empirically grounded analysis that takes not only cognitive, but also discursive, aspects into consideration, thus strengthening the validity of the interpretations made of the students' conceptions.

Results

Among the nine students with a degree in biology or environmental studies, four students conceptualised the manner in which economics excludes nature, and how nature was accounted for when included, as problematic. Two students had not experienced conflicts in their studies, although one of them also found the limited view of nature in pricing unsatisfying.

In the following section, excerpts from the interviews concerning the students' views on economics and economical concepts are presented. The views of four students (Anna, Beatrice, Cornelia and Diana), who found concepts such as 'price' problematic, i.e., not taking into account nature and limited resources, are presented first. These are then followed by the views of two students, Erica and Fanny, who found the subject of economics important as it widened their understanding of environmental problems and the business world.

Student 1: Anna

Anna described her experiences of studying economics and the way she was trying to create an integrated 'picture', also stating she did not have much interest in economics.

> *A: After studying natural science I did economics this autumn, and I'm just beginning to realise how it can be integrated to work in an optimal way, I'm not quite there yet. I mean, I haven't got a clear personal picture, I know they have to be combined, but how, what, no, I really can't say.*
>
> *C: How do you mean, what do you think is difficult?*
>
> *A: Because I really don't have much of an interest in economics, my interest is in the environment, and I think it's the same for all natural scientists, having trouble handling the economic part which is compulsory.*

In the last sentence above, Anna is referring to the requirements for entering the masters course Sustainable Enterprising.

Pricing nature. The challenges in studying macroeconomics described by Anna concerned the pricing of nature. She found that the monetary values ascribed to nature were 'minimalistic' and did not include ecosystems services.[1] This can be interpreted to mean that *what* is included and calculated concerns only parts or certain aspects of nature or natural phenomena, which is not accurate or 'enough' according to Anna.

C: You began by describing a way of thinking in the subject, what did you mean?

A: Well, you have to think in terms of money all the time. Not values or something like that, but the fact that everything has to be shown in dollars and cents when a decision is to be made, and my worldview really opposes that.

C: Is it because you can't price everything in dollars and cents?

A: No, it's difficult, you have to price everything because the world is governed by economy, sadly enough, so you have to price it otherwise these economists won't understand. It's difficult for me because often enough the value you put on nature is minimalistic, the real values are so much higher, and so often they are valued less than they should be. But there is no one that can do it, it's personal values that give nature a value.

C: Is it? Personal values?

A: Actually, yes, no, but these minimalistic accounts people have done, they are only based on the loss of certain ecological services.

Anna described her difficulty with pricing nature, in terms of not being able to include everything that she found valuable, several times. When Anna carried out a task in environmental economics with a student who had not studied biology, she became aware that her way of viewing nature, and how it should be accounted for, differed from those of a classmate.

C: This task you worked on, pricing a meadow, why is it important to save the meadow?

A: For example, when you maintain biodiversity, you maintain resilience in nature, and it's important to avoid monocultures because then you have the risk of getting noxious insects that will destroy everything completely. /…/

C: But your fellow student, she could also have tried to price the meadow?

A: Yes, but it's not part of the way they do pricing, perhaps they don't…, I don't know. You have to have knowledge regarding ***what*** *to take into account, what is known as valuable. But of course there's been progress, in environmental economics, and that's very good.*

When asked if the 'economic system somehow could "marry" the natural system', she replied:

A: Well, it will work if you want it to. Because, we get ecological services from the environment, and if we use them properly it can work. But, also, there can't be too high expectations on economic growth and things like that. You have to adjust to the thought of things working in a reasonable way, not maximising profit.

Student 2: Beatrice

'The environment' as 'externalities' in classic macroeconomics. In the course on macroeconomics that Beatrice attended, concepts such as nature and environment only featured in the curriculum in terms of 'externalities'.[2] However, when writing an essay in the field of environmental economics, which was optional, she became aware that valuing nature monetarily was a way of accounting for nature.

B: When I studied macroeconomics, environment wasn't something that was mentioned in lectures, the environment and limited resources isn't something that is taken into consideration, it's only addressed as externalities – increasing of costs. So, with this essay we wrote in environmental economics we really came to understand that you can value the environment in some way, that you really can't, but perhaps must do, in order to make people realise it has to be conserved, that is actually costs something.

C: What do you mean, 'that you can value the environment in some way, that you really can't, but perhaps must do'…?

B: Because, well, the way society works, it's all about economic growth and maximising the economy as much as possible, and in order to make the people who take care of and work with economy [understand] you have to price nature, that's the language they'll understand. So, if you price nature they'll understand that it costs.

Pricing nature. Beatrice, like Anna above, also described the difficulty of pricing nature. Here she is addressing the problem of ascribing an appropriate value when there are several stakeholders and presumed interested stakeholders.

B: It's very difficult to price nature and there's no procedure that will capture all values, somehow. It's difficult…

C: What is not captured?

B: Well, take my example with the owners of camping grounds on the island Öland, we valued how much their cost of production would increase by taking away all the algae on the beaches [in order to attract campers and caravans], and the values that are not included [are] for example how much the people living by the beaches valued the environment, and people who come there for the day. Now

there was simply an increase in costs of production. And people might come there anyway; there are all these different aspects…

C: You mean it's not estimated how other groups of people value the beach?

B: No exactly, and furthermore, you don't consider what it's worth for a seagull, having a clean beach. I mean animals, such values, what's it called – existential,[3] I'm not sure, but values that are not in the interest of humans, but for, say, animals…

Student 3: Cornelia

Cornelia has conducted studies in a programme entitled 'Environment and Development', where the need for interdisciplinarity and understanding different ways of conceptualising the world was often stressed. As part of the programme the students studied economics, but these courses were not introduced at the start of the programme and Cornelia describes the tensions the class experienced in relation to the environmental courses.

C: [We studied] classic and neoclassic economics and the teacher was almost personally accused and attacked, we said 'but why does it look like that, it shouldn't be like that!'. And the teacher replied 'but it's a theory, it's not evil in itself'. There was a really harsh atmosphere in the whole class – 'you have to consider the environment'. So, there was a clash the first time we were presented to the pure, classic theory of economics. But eventually during the course we talked about how different systems are connected and so on, but in the beginning… /…/ As time went, well, I guess the teacher wanted that reaction, and in the coming lectures he stressed that 'this it is not a matter of right or wrong, it's a theory, none is better than the other' and he presented several theories.

The environment as 'marginal costs'[4] in classic macroeconomics. As indicated above, Beatrice mentioned the concept of 'externalities' as problematic in describing the account of nature in economics. Cornelia found the term 'marginal cost' to be similarly problematic.

C: Neoclassic and classic economics doesn't consider the environment, instead they do economic calculations on the marginal costs, but then I asked 'for what reason?'

CL: You mean environment is part of the models as a marginal cost?

C: Yes, exactly, it was like this, 'well, how much does it cost to produce this unit?' 'What's the demand, supply' – and all of that. The environment wasn't really considered, wasn't included, as something in its own right.

What Cornelia is referring to when saying 'in its own right' is not obvious. The issue she might be addressing is if and how nature is included in theories of economics.

Pricing nature. Cornelia, like Anna, addressed the services that nature provides that are important but not accounted for, and Cornelia discussed the problems related to the term 'tragedy of the commons'.

C: I think it's problematic how to price, well let's talk about cows again, the cow's ability to produce milk, or to estimate value of the park outside, how to price it. I think that's the most difficult thing.

CL: But what makes it so difficult?

C: These big ecosystems services from the ocean and the air, nobody owns that. The rights of owning are perhaps limited to, what's it called, a fishing certificate, and there's…

CL: Are you referring to the tragedy of the commons?

C: Yes, exactly

CL: Okay, and there's no ownership, no selling and buying, so how to find a value…

C: and no obligations and no rights /…/ You have to, in the end, create a win-win situation, and that's not so easy.

Student 4: Diana

With a bachelor's degree in biology, Diana studied macroeconomics at Stockholm University with the aim of entering the masters course Sustainable Enterprising. In talking about her experiences she described the way she perceived the economic view of nature, as opposed to her own.

C: When you say there's an ideological difference, what do you mean?

D: The difference is that the economists often think there is a 'base' that is in the economic world, or possibly in the social world, while we who have studied biology see the economic and social world depending on ecology as a foundation. So, it's the opposite really, the world up side down /…/ The way I see it, nature constitutes the base, we are part of nature and through nature we get economy, that is, what is traded is taken from nature, it's not something that's just there like magic in a factory, it has its origin in nature. I think that's why I found it very difficult in economics – they picked out the environment part, and sort of put it on the side, like an appendage, instead of the way I see it – as the foundation for everything. Because, if nature wasn't there, we wouldn't be here ourselves.

Pricing nature. Diana finds pricing impossible and even 'dangerous' since aspects such as time and change may not be possible to account for. She also talks of a resource such as air as being 'invaluable' since it is the foundation of life; if there's a loss it's irreplaceable.

D: I don't think everything should be given monetary value, it's actually impossible to do I think. It's more of a thought experiment, it might even be dangerous to do, since you have to take time and change into account. It can be terribly misleading. But also, it's very individual. That is, what value you give, it depends on who you ask.

C: You mean estimating value by asking people around, for example, a forest or recreation area?

D: Yes, exactly, it depends on how you look at it. A forest for example, you have the landowner, the owner of the forest, the forestry company, and the people who use it for recreation, so it's impossible to find…

C: Have you considered pricing in relation to common resources?

D: Some things are invaluable in a sense, so of course it's very difficult, but still you have to do it, I don't know…

C: What do you mean by invaluable?

D: Well, they're the foundation for life, you can say, if those things don't work, then there's nothing, no people either. If we destroy the air for example and there's no air to breath we can't live so that's invaluable. It's valuable in a very special way.

The views of the students presented above indicate that they saw their economics studies as challenging in various ways. In the following section two students' views are presented. They conversely, instead, found the subject valuable in the positive way it challenged previous ideas and added knowledge in relation to a business context.

Student 5: Ester

Ester did not give any accounts of perceiving difficulties in encountering the subject of economics. Instead she related the subject to her knowledge or worldviews from environmental courses and said:

E: In one way I think, since I had only taken environmental courses, we see things in a simplistic way. /…/ Us, on the 'nature side'. It's not as easy as I thought; you can't just stop cutting down the forest, or simply stop fishing, because we want to conserve nature. You have to get the economy going to make the social life work; perhaps one way to see it is as a social ecological system and to see it as interrelated. If the social system doesn't work, the ecological doesn't work either.

Ester gave a description of the views students hold of each other in the subjects of biology and economics, and here, she is probably referring to the different professional groups as well.

E: I feel there's a conflict between economists and biologists. They look at us thinking, 'you don't know how things ***really*** *work, and without the economy society wouldn't function'. But we look at them as those people who destroy for us. I really want to know how they feel, sort of, and in that way incorporate the two disciplines, and be able to work towards the same goals.*

Student 6: Fanny

Fanny was the other student, apart from Ester, who also found the studies in business and economics to be of a positive kind.

F: There's not been any conflict due to my natural scientist background. Rather, I've realised that it's a tool you need to be able to work in a company and understand how the whole company works. /…/ My picture of environmental work is having this narrow focus, while I want to be part of budget planning and do understand the need of maximising profit.

Pricing nature. Fanny answered the question on how she perceived pricing nature with discussing the use of pricing, as the world is 'too complicated'. She also mentioned the finiteness of resources being important to consider:

F: Personally, I don't think you can use economics all the way, because the world is much too complicated, for example the natural resources will come to an end – there's a big conflict. I mean, how is that dealt with in economics?

Summary of Findings

Anna and Cornelia's conceptions of studying economics are clearly of a challenging kind. Anna seems to be mainly interested in the environment and found it problematic that '*everything has to be shown in dollars and cents when a decision is to be made, and my worldview really opposes that*'. Yet, she is eager to learn and tries to combine her biological knowledge with economics. Cornelia, and her class, came into conflict with their lecturer regarding the way nature is not taken into account in economics theories. Diana also described the clash with the subject in terms of what is considered as 'base' in the subjects of biology and economics. Encountering economics meant 'flipping the pyramid' and considering nature as an 'appendage' and not as a foundation. However, two other students, Ester and Fanny, found no such challenges in studying economics. On the contrary, Ester considered her environmental studies and viewpoints in the light of economics and revised them as being 'simplistic'.

Regarding conception of pricing nature, it is perceived by all but one student as difficult, insufficient or even 'dangerous'. Their argument is that resilience (Anna), ecosystem services (Cornelia and Diana) and limited resources (Fanny) are not taken into account. Beatrice and Diana also addressed the issue of Contingent Monetary Value (CMV), which is a valuing procedure to find out the willingness to pay among people or parties (Freeman, 2003). It is worth noticing that some of the issues discussed by the students are also addressed in the

literature and in current research projects (see, for example, Arrow, Dasgupta & Mäler [2004] on resilience, and a new research project on valuing ecosystems services at the Beijer Institute, Stockholm [Beijer Institute homepage]).

In summary, the findings show that all of these students see the benefits of pricing nature in relation to their future profession and environmental concern but, at the same time, all the students perceive different difficulties or insufficiencies in doing that.

Discussion

The results presented here can be considered in relation to students conceiving of economics as 'alien' knowledge, as quoted earlier by Meyer and Land (2006). The students' reactions were of 'anger' and 'disbelief', 'despite students agreeing that such approaches can serve to achieve objectives consistent with their original beliefs (such as wildlife preservation)'. This study can help to clarify what causes this aversion and seemingly contradictory reaction. Pricing is one way of valuing something but, according to these students, a way that excludes aspects of nature, which they find valuable. Also, pricing means surrendering to a system which these students oppose, where economic perspectives and theories are viewed in ideological terms: it is the norms by which much in the world is governed and ruled. This is perhaps where the conceptions of the 'episteme' of a subject clash with personal values and beliefs. This can be regarded as the affective dimension of the students' conceptions, and how it challenges conceptual change. The way values and emotions come into play in the learning process and the way they challenge conceptual understanding has been studied in previous work by Lundholm (2004c; Lundholm & Rickinson, in press). However, when considering the subject of economics, it also entails certain characteristics, as quoted earlier by Davies (2006). Its abstractness, in not pertaining to the individual or company as such, allows for mathematical modelling. Systems thinking is also central, again working as representations enabling modelling and the inclusion/exclusion of different aspects (variables). In that context, nature becomes a variable among many others. However, this depends on what kind of economic theories we are talking about, since there are debates within the subject as well (Davies, 2006). Considering this cognitive dimension in understanding economics is crucial, pointing to the acceptance of abstractness and a systems approach. The statements by the students on the importance of accounting for nature, in several ways, increase the complexity. Indeed, considering both the human and natural world increases complexity greatly.

In discussing the results of the present study, the research by Southerland and Sinatra (2003) on students' understanding of the theory of evolution and 'intentional conceptual change' can also be considered. They write:

> Evolution is a complex topic that is inherently difficult to learn even when one's personal beliefs do not conflict with the content. The situation becomes even more complex when firmly held religious beliefs are perceived to be in direct conflict with the scientific explanations of human evolution in general, and heightened for explanations of human origins. /…/ The learning of ill-defined, complex, or controversial topics that

> conflict with belief systems (such as human evolution) may require that intentional level constructs be evoked if learning and change are to occur. (p.336–337)

If we consider the students' belief systems in the present study, the environment is considered of value to them. From their point of view, economics generally and the pricing of nature specifically might therefore be considered 'a controversial topic'. In the present study, therefore, what might be at stake is the interaction of affect and cognition, a process that is yet to be explored, as described by Southerland and Sinatra (2003):

> We do understand affect to play a mediating role in the conceptual change process, having a recursive relationship with the constructs of epistemology and dispositions, and allowing for inhibiting or the invocation of intentional level constructs and subsequent processing of information. More research is needed however, before we can fully explicate that role. (p.338)

In describing the ways students progress in their understanding of knowledge, Perry (1970/1999) discusses how the term 'commitment' can contribute to our understanding of this cognitive and emotional process. Commitment is a kind of equilibrium, and Perry refers to the work by Piaget, but who did not research young people beyond adolescence. Perry writes:

> The second conceptual contribution is that of Commitment as activity involving stylistic equilibrium. Here the reference extends beyond the content of Commitment to embrace a process in which the person integrates the expressive and the instrumental through affirmations in which his standards are ultimately aesthetic. Because the flowing equilibria that an individual maintains among the stresses of coexistent incompatible states are so personal (e.g., wholeheartedness in the midst of tentativeness), our presentation of the anatomy of the style in Commitment should be a contribution the concept of identity. Furthermore, since what is at issue is the person's manner of experiencing and expressing responsibility, the concept forms a link between the individual and society, a link complementary to, and enlivening of, the concept, of role. (p.234)

Perhaps, what we see in the ways the students experience economics can be understood in relation to the way Perry describes and discusses 'commitment'. However, this means that the students have an awareness of the episteme of economics and biology or ecology, and in the context of that understanding decide, commit, to a way of seeing and explaining the world, in this case to the latter. However, several of the students stressed the need for integration of the domains, on a personal and professional level, thus *seeking* commitment. But, the interviews do not give clear evidence that the students are actually talking about economics in this epistemic sense. Some of the students' experiences seem to be more of an emotional reaction, although they are ethical as well, reflecting their stances and values.

Notes on the Contributor

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Endnotes

1 '*Ecosystems services* are the conditions and processes through which natural ecosystems, and the species that make them up, sustain and fulfil human life. They maintain biodiversity and the production of *ecosystems goods*, such as seafood, forage, timber, biomass, fuels, natural fibre, and many pharmaceuticals, industrial products, and their precursors.' (Daily, 1997:3)

2 Externalities can described as 'negative – when the action of one party imposes costs on another part – or positive – when the action of one party benefits the other party' (Pindyck & Rubinfeld, 1997:658). An example of a negative externality occurs when 'a steel plant dumps its waste in a river that fishermen downstream depend on for their daily catch' (*ibid.*:658).

3 It can be assumed that Beatrice is referring to the term 'existence value', also referred to as 'non-use value'. For a discussion of the term used in the economics literature see Freeman (2003:139–143).

4 'Marginal cost' is the cost for a firm to produce another unit of a specific good.

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Environment and Sustainability Education in a Changing South Africa: A critical historical analysis of outline schemes for defining and guiding learning interactions

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Abstract

This paper examines how, in response to emerging risk, methodological narratives for conservation (CE), environmental (EE) and now sustainability education (ESD) were constituted in diverse settings within a changing South African state. After documenting an awareness creation perspective underpinning early extension and experiential activities, the study examines shaping social processes and changing outline schemes for defining and guiding planned learning interactions (methodology) within the broadening field into the present day.

The critical historical analysis developed in the study reflects a well-documented shift from early top-down (intervention/extension) to more participatory approaches (collaborative engagement/stewardship). A situated process-mapping of changing orientations also reveals characterising methodological features across the contours of an increasingly diverse field of conservation, environment and sustainability education. The maps resonate with and reflect situated learning interactions that involve:

- *Clarifying risk and associated information in context (situating story)*
- *Close review of an issue as a concern (moral proximity)*
- *Asking questions to understand the issue in context (enquiry) and*
- *Trying out ways of doing things differently (practical engagement)*

The review concludes that these open-ended processes are seldom found together in community and school curriculum contexts. It thus points to a need to examine:

- *Learner access to available knowledge resources*
- *Processes of close purposeful engagement and*
- *Practice-based deliberation in the mediation of socially responsible choices*

Finally the study examines processes of exclusion across the outline schemes for education. Noted is the knock-on effect of the separation of people and nature at the fences of nature reserves. Here ecology developed as a conservation science of interdependence that was deployed in early awareness programmes against the unawareness of rural land management. Later perspectives reflect landscapes as intermeshed social-ecological systems at risk. Here it is somewhat ironic that the indigenous knowledge practices of rural people are often deployed as idealised models of sustainability against the wasteful practices of modern age.

The analysis recasts environment and sustainability education as open processes of situated re-search and deliberative meaning-making interaction, notably reflexive social learning processes that are planned and undertaken in response to risk within in a community of practice.

An Opening Question

The study was undertaken as part of ongoing inquiry into the way in which learning interactions came to be oriented and narrated in and as environmental education (O'Donoghue, 1993; 1997; 1999; Lotz-Sisitka & O'Donoghue, in press). The research question arose alongside a regional consultative process on education for sustainable development (Lotz-Sisitka, Olvitt, Gumede & Pesanayi, 2006) that pointed to a rhetorical marking[1] of ESD practice, notable for this study in relation to the ways in which learning interactions are constituted (methodology). A reading of data gathered in the review of a professional development programme (Schudel, 2006) also pointed to methodological concerns in relation to active learning (O'Donoghue, 2001) in school curriculum settings.

The rhetorical problematique in ESD discourse and a concern for clarifying the outline schemes defining and guiding learning interactions (methodology) gave rise to the pedagogical question for this study, namely:

> *How are learning interactions being methodologically constituted in the developing contexts of our work?*

In the context of work in the Environmental Education and Sustainability Unit (EESU), Rhodes University, we were concerned with methods and materials that engage learner purpose and provide immediate and tangible benefits in African contexts of poverty, risk and vulnerability. At another level, in work with researchers on indigenous knowledge practices, with the same concern for a more situated and purposeful pedagogy in mind, I also became more conscious of environmental learning as re-searching engagement around emerging questions of sustainability and lifestyle choice.

An Unexpected Turn in the Study

The outcomes of the critical analysis in this study are particularly challenging as some insights run counter to an earlier reading of changing methods (O'Donoghue, 1993; 1996). The earlier analysis of one immersed in an emerging story and the shaping axes of tension of the day partly account for the reading of methodological change as a developmental progression where the new displaces the old. Although this reading of developing methodology is consistent with and reflects socio-political change shaping changing methods, the earlier research did not adequately tease out continuities across succeeding perspectives that were surface-read as changing methods.

Data and experience within a longer time span and a wider and more fully developed field of conservation, environment and sustainability education now allows a review to derive more refined interpretative insight across continuities without an undue influence of the ferment of changing ideals. The reflexive experience of noting how comparative analysis in the earlier study had obscured a sense of developing continuities, sensitised this review to how, despite sustainability appearing to constitute a fresh focus in the global ferment of ESD, it was clearly manifest in earlier perspectives.[2]

Clarifying Sustainability within Narrative Ideals

Unlike in Europe and elsewhere in the West, where there was intense and protracted debate on distinctions between EE and ESD, the relationships between environment, society and development (viz. sustainability) was explicit and well established in many environmental education programmes in southern Africa. There was thus little oppositional posturing around EE and ESD as there had been in the earlier axes of tension amongst conservation, outdoor and environmental education (Irwin, 1989), much of which was more a matter of the social politics of the day than around conceptual and methodological concerns (Irwin, pers. comm., February 2007). Perhaps the lessons learned in these and other contestations left us unwilling to repeat the often futile dialectic politics that can accompany naming games, especially at the level of new movements and changing slogans.

Contemplating ESD with its more global origins and tracking the idea into southern Africa was thus approached as a critical review of the new in light of a concern to probe and enhance sustainability in what was already being done. The EESU concern informing the review was a consideration of the orientation of our activities and a more coherent taking up of sustainability concerns into the UN Decade of Education for Sustainable Development.

With regard to schooling, the question is contemplated in a similar way in relation to the advent of a new outcomes-based curriculum in South Africa. Here, changing ways of working with a curriculum where environment is purposefully designed in as learning outcomes is closely examined around learner purpose. Curriculum and learner purpose are assumed to coincide in meaningful learning, so the research gave critical attention to portfolio evidence of these interactions within a professional development course (Schudel, 2006).

In these ways, the study sets out to clarify methodology in relation to questions of sustainability, learning and learner purpose in the increasingly diverse settings of planned learning interactions around ever-widening questions of environment and sustainability in South and southern Africa. The research findings are intended to inform the professional development and community support work of the Environmental Education and Sustainability Unit within the UN Decade of Education for Sustainable Development. To this end, a critical historical and process-modelling research design was developed to review evidence of emerging pedagogical practice (methodology) in the southern African contexts of environmental education within which our activities and courses are undertaken.

Developing a Research Design for the Study

Working with a long-term vantage point on historical social processes after Elias (1989), and the historically constituted political sociology of Popkewitz (1991) in educational studies, the study identifies and probes social processes shaping and playing out in learning interactions within the developing methodological narratives informing environmental education.

Seemingly in contradiction to a prevailing sense that environmental education activities are mobilised against the destructive march of modernism, Popkewitz (1991; 2000a; 2000b) describes how diverse processes of education emerged as an integral part of the modernist

project. With this insight it is possible to note how, within the globalising trajectory of modernism in South Africa, first conservation, then environmental and now sustainability education, emerged over time and in response to the 'rubbish and risk'[3] produced by and in the modern state. Insights into the apparent contradiction here, between education as resistance to modernism and as social re-orientation within the modernist project, is to be found in the mix of social movements and state institutions that took up narratives engaging nature at risk and human culture as cause. It is notable, for example, how education imperatives arose in conservation science institutions in southern Africa as interventions to create awareness. Here the interplay between ecological research and the enforcement of regulations (law) in these knowledge institutions gave rise to extension services and stewardship initiatives as regulatory land management interventions (structural functionalism) that later became more collaborative[4] into the democratic state.

With the advantage of a longer-term view, it is possible to note how within the reduction of ambivalence into modern times:

- everyday ways of knowing and doing things under the mediating hand of community receded against the appropriation and knowledge management orientations of the institutions of the modern state,
- education developed as a 'tool' within the modern state for the institutional mediating of the orientation of citizens, and
- knowledge discourses of information dissemination for creating awareness of developing risk emerged to keep the modernist project on track.

To clarify the new global politics of changing ideas and labels Popkewitz (2000a) also notes that narratives of social and educational reform should be interrogated in ways that 'go against the grain'; in the sense that the systems of reason that are embodied in reform attempts and play out as education (e.g., EE and ESD) need to be viewed as potentially problematic and historicised. For this study the intention was to critically review (problematise/historicise/process-map) the shifting methodological landscapes of southern African conservation/environmental education.

To this end, the enquiry is conceptually situated and developed within a context of experiential learning and an historical analysis is taken up within axes of tension that began to develop within conservation and environmental education in the 1980s. The study notes how communication campaigns to get the conservation message across and to create the necessary awareness of risk to foster behaviour change (institutional structural functionalism) began to stand in contrast with experiential learning methods to create environmental awareness through hands-on learning in wild nature (liberal humanist/naturalist ideals). Divergent approaches to the framing of learning (methodology) and changing methods are identified and probed as they emerged amidst the twists and turns of diversifying fields of educational practice.[5] How methodological propositions arose in resonance with the social politics of the day and were shaped as methods in the developing fields are critically represented and examined within the concepts of the day (problematised/historicised) and reviewed in developing context (historicised/process-mapped).

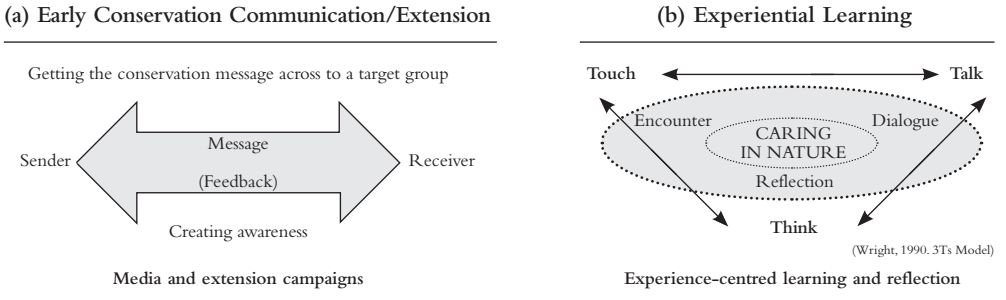
Situating the Research Design to Contemplate Changing Methodologies

As noted above, a situated vantage point for the study was identified in emerging methodological tensions amidst structural functionalist communication campaigns and nature-based experiential learning. These methodologies are represented in Figure 1a & 1b as open-process maps. In the background of Figure 1b is a representation of the framework of propositions behind the more explicit scheme (Touch; Talk; Think) for defining and guiding experiential learning interactions.

Elias (2000) metaphorically likens social processes to a changing dance pattern or a game. He poses that tracking how processes of intermeshing change over time is useful for contemplating social change. By representing the steering ideas and changing methods in simple diagrams, I have contemplated and probed developing continuities in a context of methodological change that reaches into the ideas in play into the present day.

In Figure 1a, awareness creation in early conservation communication was extended to caring in nature (Figure 1b) through nature-experiences methods for fostering awareness in wild nature, particularly for modern children who had grown up in urban areas without much direct experience in the natural world. The nature-experience narrative coincided with the popularising of ecology and an opposing of nature at risk with a modern culture within which unawareness is giving rise to degradation of the natural environment.

Figure 1. Early methodologies



Within the ferment of tensions between nature at risk and cultural unawareness in the modern world, Symbolic Interactionism[6] was used to frame and narrate (methodology) experiential learning. The perspective was first used in a participatory evaluation process in the 1990s and the idea of Touch – Talk – Think (Wright, 1988) came into use as an outline scheme for defining and guiding teaching and learning interactions (methodology) in that context. In the diagrams (Figures 1b; 2a & 2b), Symbolic Interactionism (Charon, 1995) is represented as an underlying perspective (encounter, dialogue, reflection) around the ideal of awareness creation through caring in nature.

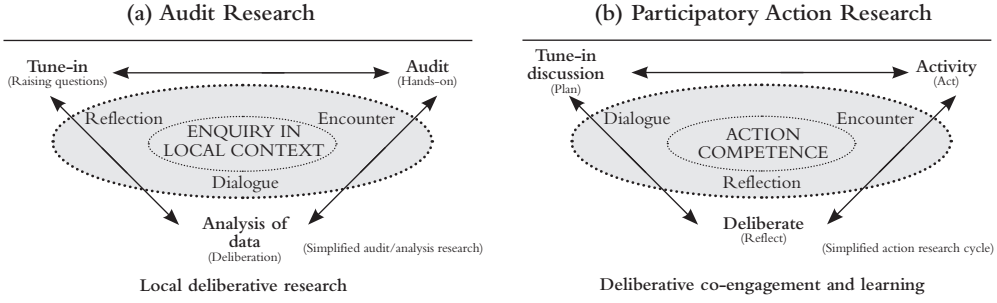
In the study, this open-ended representation is used as an historically situated referent to critically contemplate changes in orientation[7] within changing schemes for defining and guiding learning interactions. The dialogue/encounter/reflection framework is thus

carried forward to process-map shifts in ideals and methods that emerged as environmental education that was methodologically reconstituted (Figure 2) within the democratic ideals of a post-apartheid South Africa today. Methodological continuities and trajectories within these processes of change are then contemplated in a synthesising representation (Figure 3).

A critical historical view of developing social processes allows one to note how early methodological perspective was constituted within the naturalistic culture of environmental movements that contrasted nature and culture. This dialectic arose in the modern condition as an alienating turn shaping experiential learning imperatives to bring awareness of nature back into the modern world of environmental degradation. As mentioned earlier, the focus on awareness was the same as earlier conservation extension and played out in how field guides at environmental centres took learners out on interpretative trails to experience nature (encounter) in deliberative contrast to the not always obvious 'rubbish and risk' in urban environments (dialogue and reflection).[8] These early experiential interventions also included a directed action-taking imperative that took the form of clean-up campaigns. Clean-ups became firmly entrenched within widening education activities on annual calendars as awareness-raising activities for changing the attitudes, values and behaviour of individuals and bringing about change in the world.

Probing Emerging Methodologies of Local Engagement and Action

Figure 2. Enquiry and participatory methodologies



The contours of two methodologies for more local, critical and participatory approaches to environmental learning are depicted in Figure 2. Audit research (Figure 2a), for example, was added to nature experience programmes that sought to engage learners in the concerns of their local environment. This developed amidst the tensions of needing to attract clients to the environmental centres and a developing disillusionment with nature experiences being enough on their own to give effect to the desired changes in behaviour. Conservation agency staff running centres noted that most problems were outside the parks. Here the impact of human activities played out as habitat transformation and loss of indigenous species (biodiversity), change that impinged on wilderness and protected areas.[9] Enquiry and problem-solving approaches thus developed for participants to carry skills of hands-on engagement in nature into problem solving encounters with local environmental problems. This subtle axis of

methodological change constituted a significant shift in the learning context (nature-home) and its orientation (experience-enquiry).

Into the early 1990s, widening environmental movements and rapid democratic change in South Africa (rights and social justice imperatives in response to the apartheid injustices and risk of modernity) shaped action research approaches on a wider landscape of people and nature. The loosening played out in an inversion of a continuing oppositional politics in relation to people and nature. 'Save the people, not the rhinos' emerged as a slogan response to earlier nature-centred ideology. A tongue-in-cheek 'save the whites, not the rhinos' emerged in humorous response reflecting some of the fears of a white minority being carried along in a whirlwind of social change as the African National Congress displaced the National Party in democratic elections to overturn the oppressive apartheid system.

Within these processes of change, a socially critical movement accompanied the emergence of critical pedagogy and was reflected in a rapid popularising of participatory action research. Participation was aligned with ideals of constructivist learning that shaped more action-centred and learner-led activities now facilitated by educators. This is most notable in *action research and community problem solving*, a methodology appropriated from a global engagement with water quality and sustainable watershed management. A little later, the Danish *action competence* approach was also widely appropriated in southern African educational activities, particularly into the late 1990s through the Danish-funded National Environmental Education Programme (NEEP).

Participatory action research and action competence approaches (reflected in Figure 2b[10]) also emerged in response to instrumental programme designs (institutional structural functionalism) in environment and health education. Action competence emphasised learner-led activities mediated by deliberative co-engagement that highlight respect for difference (plural dispositions) in democratic societies. Seen against the strong imperatives and dialectic re-orientation to people and action research from nature experience, and collaborative engagement in relation to communicative intervention, the processural re-orientation is once again slight but significant.

An Overview of Broad Shifts in Pedagogy

Ecology provided the symbolic capital of concepts that opened up a modern sense of the natural life-supporting systems and processes at play in the world. The new sense of awareness that came to those encountering these ideas in nature reserve settings gave rise to imperatives to educate others as they looked out at a degrading world that contrasted with the natural abundance in parks. Here, as noted earlier, environmental degradation was ascribed to unawareness in people and education in the form of extension programmes from conservation institutions and nature experience activities in parks emerged. Here, developing outline schemes (communication, extension and experiential) for defining and guiding learning interactions opposed ecological interdependence (nature and awareness) with human practices (culture and unawareness), initially in conservation and then later in environmental education. It is of note that the emergence of the one process (interaction with ecological propositions in parks) constituted

the axes of tension for the other (education), with these processes (education) referring back to the constituents of the first (ecology). In this way early environmental learning was constituted as somewhat of a closed, self-referential loop.

The methodological terrain that was initially opened up as natural environment (ecosystems and hands-on learning) was successively redefined and reconstituted around a broader view of environment as interacting political, social, economic and ecological dimensions. As these wider perspectives developed, the primacy of the early ecological knowledge capital fell away and was displaced by environmental learning as deliberative co-engagement in the challenges and risk of the day.

In the South African trajectories examined in this study, the initial ecological and later widening environmental learning processes were methodologically constituted (pedagogy), initially in experiential methodologies where learners would derive re-orientating experiential learning in wild nature modelled on the experiences of those initiating the new ways of learning. However, induction into the necessary knowledge capital was displaced by an idealising of the experiential encounter[11] in nature. The methodological ideal that experiential awareness in nature and hands-on encounters with environmental problems would lead to the desired changed in behaviour (behaviourism) was soon under critical scrutiny as more locally situated and participatory fieldwork methods emerged amidst new ideals of democratic social change in the region. For school curriculum contexts the ideals were reconstituted as active learning processes but, in a similar way, meaning-making work with the knowledge capital necessary for critical insights (socio-ecological, economic and political) was not always explicit as the learning interactions moved through subtle re-orientation as ideals of nature and sustainability were re-shaped within a more individualised, social construction perspective (constructivism) accompanying the social politics of a developing democratic state.

The advent of environment being designed into the new National Curriculum Statement and the learning outcomes of each learning area was heralded as a significant development. An outcomes based curriculum (OBE) is designed so that learner and curriculum purpose might coincide as prior knowledge is mobilised towards the attainment of specified learning outcomes that are assessed. Although environmental learning and the OBE curriculum has been extensively reported, little research has been undertaken on the environment and sustainability outcomes of the environmental learning interactions inscribed in curriculum. Schudel (2006) probes some of these concerns in teacher portfolio evidence assembled in a professional development programme. There is currently little evidence of lines of continuity from the coincidence amongst learner and curriculum purpose to the deliberation and enactment of more sustainable lifestyle choices. This may be too much to expect of a curriculum process and we may have to look at issues of educational quality to contemplate the wider question of social change and sustainability in African contexts of poverty, vulnerability and risk (Lotz-Sisitka, pers. comm., February 2007).

Conservation, environment and sustainability education initially implemented through campaigns to create awareness and to engage people in problem-centred learning interactions also reflect a decentring (situating) and participatory (collaborative) shift that creates the illusion that an imposing tyranny of the past is being displaced by a new democratic freedom. These

shaping influences played out in the early conservation and environmental education ideals of *getting to people* through campaigns and nature experiences to *getting people together* to engage diverse environment and sustainability concerns and to foster better ways of doing things in local context (collaborative extension and stewardship superseding earlier extension and communicative interventions).

Early behaviourist and later constructivist[12] approaches to teaching and learning that are often contrasted in environmental education texts, have a critical engagement with modernism in common, despite a concern for learning interactions in wild nature on the one hand and collaborative engagement around ideals of democratic agency and activism on the other. At one level the processes are not dissimilar but on the other the orientating ideals appear worlds apart. As the steering of education and change was increasingly deferred to participants constructing knowledge in local context, teachers have become facilitators in learner-led engagement with environment and sustainability concerns. The attendant shift and broadening of environment and sustainability within the intermeshed socio-political and methodological trajectories of change is reflected in a new National Curriculum Statement for education, namely, learning processes that reflect *the relationship between human rights, social justice, inclusivity and a healthy environment* (DoE, 2002).

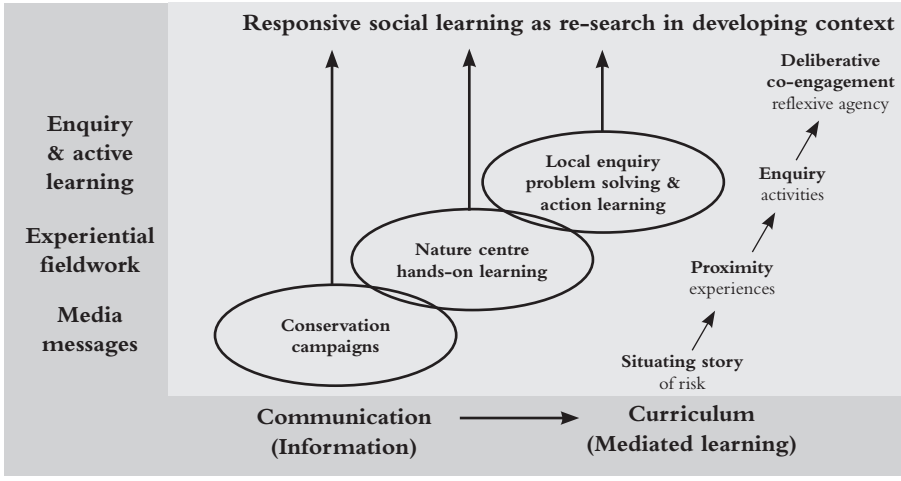
Probing Continuities within Methodological Change in a Diversifying Field

An earlier reading of some of these methodological shifts (O'Donoghue, 1993) suggested that old methods were being superseded by more contextually situated and participatory methods. All early and developing methods (communication, experiential, local enquiry and action research) are, however, still widely apparent in the field as campaigns, nature centres and co-engaging enquiry and action work in context. Process-mapping allowed the study to note how seemingly radical methodological shifts within the changing social politics of the day were subtle and not incompatible at the process level.[13] Elias (2000) notes how small changes can have incrementally profound effects and Popkewitz (1991) points to how change can be somewhat superficial and rhetorical at the level of ideals that play out in intangible ways. Both of these processes seem to have been at play here as the methodological narratives have developed alongside a period of rapid social change. On the one hand we seem to have a rapidly evolving social politics of methodological change, with notable ideas like education for sustainable development emerging, whilst, on the other, there is a subtle re-alignment that has opened up a wider range of learning interactions. To examine the trends, the methodological shifts noted were each mapped in Figure 3 as they had emerged and characterising features were noted on the right-hand side of the diagram. The representation of methodological processes and trends reflects:

- A shift from communicative intervention (top-down) to a curriculum of learning activities fostering more locally engaging learning around environment and sustainability concerns
- Parallel trajectories in each area that reach into the broader orientations of the present day

- Methodological features that characterise these and loosely correspond with information transfer, nature experience and enquiry/action processes

Figure 3. Comparative review of developing methods



The historical representation in Figure 3 opens up a sense that there is a fuller reading of the emerging story. Whereas outline schemes for defining and guiding teaching and learning interactions for processes of social re-orientation have developed within the social politics of the day, there are characterising features that reflect key processes across the diversifying and broadening field. These perspectives point to a possible need to reconsider how educational imperatives are being methodologically constituted as pedagogy across society as a whole – for learning interactions in particular communities of practice and within formal education as a process of social induction and cultural re-orientation within the sustainability challenges of the day.

This representation of parallel and somewhat complementary trends reflects characterising features within a diversifying and interestingly homogeneous field. Another dimension, the interplay between learning as social induction within knowledge arising in intergenerational life and education as social re-orientation within a symbolic capital of institutional propositions, still needed to be closely examined in the study. This was opened up through an examination of the patterns of exclusion that accompanied the emergence of the developing social field of environment and sustainability education mapped out above.

Patterns of Exclusion in Emerging Education Imperatives

The narrative representation and critical analysis has, thus far, been centred on methodological drivers and trajectories within the developing field of educational activity – primarily on the

story of what was included in the emergent pedagogic field. However the critical historical perspective advanced for the study would not be fully developed without consideration of exclusions – what was overlooked or consigned to the margins.

The most obvious exclusion is how fenced parks became zones of exclusion for experiential learning in nature. In the history of conservation science this exclusion is written and read as something that was done to save wild ecosystems and biodiversity. Another reading is how the attendant exclusion of indigenous people (colonial game laws and fenced parks) constituted a rupture that made these communities more vulnerable in times of drought and in the seasonal patterns of grazing, cropping and hunting that sustained rural livelihoods.

These and other colonial and modernist ruptures contributed to a spiral of poverty and land degradation that gave rise to conservation and environmental education imperatives from the parks. Here education set out to reverse the resource depletion, biodiversity loss and attendant human suffering. The abundance of interdependent living things (biota) in parks had given rise to a new capital of ecological knowledge that came into educational use for the experiential induction of people, particularly young children, into the wonders of the balance of natural ecosystems. The new institutional knowledge capital was constituted as propositions in relation to the patterns of interdependence that constitute life-supporting systems.

These new ecological knowledge systems reflect the workings of nature so that natural systems could be managed. This provided necessary institutional knowledge capital for the wild areas that now excluded people, to be scientifically managed without the local people hunting wildlife, collecting resources and burning the landscape to create pastures as they had done in the past.

It is somewhat ironic that much of the early knowledge on wildlife relations necessary to construct the new institutional knowledge capital initially developed in interaction with the indigenous people excluded from parks. Ian Player (1997) cites numerous examples of how learning interactions with Magubu Mtombela allowed him to construct his intimate knowledge of wilderness and the web of life. Mtombela's wildlife knowledge capital related the intergenerational fabric of indigenous life experiences around the use of indigenous plants and animals to sustain seasonal livelihoods. In the telling, the indigenous symbolic capital was transformed (appropriated) into relational propositions for park management. These were used to relate the workings of the wild so that culling (management hunting) and fire (habitat management) could be used to maintain wild areas without a direct relation to people, a position reflecting the new legislative exclusion of people from parks of natural ecosystems. The new knowledge capital (ecology) for land management was then used in education as a mirror for creating awareness of land degradation under the destructive hand of man.

Developed in an institutional setting, ecological propositions came to stand outside the more relational knowledge of intermeshed patterns of wildlife interaction as these had related to the cultural lives of local people. This constituted a further radical transformation where education with the new institutional knowledge developed as mediating propositions (scientific abstractions on how the natural world works) to be appropriated by learners in experiential learning interactions. The experiential learning acquired in nature was intended for relation to daily life and to give effect to reflexive social change in local contexts of environmental degradation.

Here the detached narrative that developed through the exclusion of people from parks had two outcomes. Firstly, it shaped the emergence of ecology as an abstract institutional knowledge capital of propositions for modelling and managing nature. Secondly, the successful modelling and management of natural systems had the knock-on effect of ecology becoming the knowledge capital for education activities to remodel human induced environmental degradation. In this way conservation and environmental education pedagogy developed as salvation narratives (Popkewitz, Franklin & Pereyra, 2001:161) informed by a developing logic of idealism (Lotz-Sisitka, pers. comm., May 2007) that was initially constituted around ecology as a science for sustainable natural resource management.

The complex relational dynamics of exclusion in the constituting of conservation science and the anomaly of models of nature without people being used in an educative remodelling of human activities shed some much-needed light on the limitations of early information transfer and experiential outline schemes for defining and guiding environmental learning interactions. The historical exclusions also suggest why the recent methodological trend in environmental education is towards a return to the relational and social learning (Wals, 2007) as culturally situated and reflexive learning process of re-search on social-ecological contexts of developing risk. Here the early question of human impact has been coupled with the open question of resilience to allow us to begin contemplating the sustainability of social-ecological landscapes amidst an ambivalent mix of ecological, economic and rights idealisms (Lotz-Sisitka, pers. comm., May 2007).

Despite the anomalous ways that ecological propositions emerged and were taken into early environmental learning interactions, the explanatory narratives for natural systems have developed as a refined symbolic capital for understanding the workings of the world and for resolving many environmental problems. Recent environmental education research has thus probed how reflexive re-search involves the interaction of everyday knowledges and the modern institutional knowledge capital reflected in the school curriculum. Kota (2006) and Hanisi (2006), for example, have probed how indigenous knowledge practices can be explored by learners who then draw down scientific propositions that resonate with and disrupt these. They report how these processes have allowed both insights into the wisdom in older ways as well as opening up how things might be done better in the world today.

Some Concluding Questions and Perspective

A long-term view of these broad and diverse processes of cultural change (now playing out on a global scale within the digital information age) points to how sweeping cultural change has come into effect across humanity as a whole with the advent of modernity. Environmental education emerged within a multiplicity of educations that have accompanied these changes, initially as a wild form of awareness creation education around ecological interdependence in nature and now including wider concerns in environment and sustainability education.

I am struck by two intermeshed trends in the emergent environment and sustainability pedagogy examined in this study. Notably, how prior experience has recently come to be accentuated over (and sometimes as) knowledge capital and accompanying this, how an

emerging pluralism is playing out in environmental learning as individual matters of choice amidst differing and equally valid perspective.

The emergence of environmental learning as more open matters of social knowledge and choice is seldom critically questioned. Knowledge and choice are, however, intermeshed in pedagogy in a sense that prior experience is a foundation for meaning-making engagement with knowledge capital in wider socio-ecological context. Here the illusion of a multiple choice (plurality) is not always seen as being in tension with greater reality congruence of one perspective over another. This can disable meaning-making engagement towards an agreed best perspective with an attendant social responsibility of accountability for continuing reflexive practice.

A critical historical analysis of developing methods within the increasing ambivalence of the modernist project in southern Africa illuminates diversifying ideals of change within education imperatives stripped of key perspective, tools and processes necessary for the desired social re-orientation, namely, *reality-congruent knowledge, shared moral purpose and a situated capability developed within learning processes of active engagement in enquiring practice*. It is interesting to note how these processes (situated story, moral proximity and enquiry/action) have emerged as characterising features in the key areas of knowledge representation, ethical engagement and action-centred enquiry within our broadening field. In this study, however, these processes were not yet found intermeshed in any current outline schemes (curriculum or associated teaching and learning methods) for defining and guiding environmental learning interactions in a community or school curriculum context.

This suggests a need to look critically at current curriculum, methodological perspective and methods asking:

- Do the participants have access to all knowledge resources that might enable them to grasp and grapple more coherently with the issues they are engaging?
- Are learning interactions arising with close, purposeful social engagement in environment and sustainability concerns?
- Do learning interactions reflect practice-based deliberations that might allow the better mediation of choices that are more reality congruent and socially responsible?

The provision of better knowledge resources and the development of more engaging learning activities are an important curriculum challenge, particularly where curriculum is seen as contextually constituted and culturally inscribed.

The critical history and process-mapping methodology applied in this study has provided some insights to clarify methodological ambivalence with respect to sustainability and ESD. The knowledge capital and questions emerging in the study shed light on a need to probe research methodology and pedagogy for possible lines of coincidence within social history and developing contexts of risk. A review of lines of coincidence between how environment concerns are emerging and careful examination of how we are responding by way of outline schemes for defining and guiding education responses might yet inform pedagogy for situated environmental learning.

The study opens up the prospect of education processes being recast as social-ecological and historically constituted action competence (agency) emergent within environmental learning as situating re-search and deliberative meaning-making interactions; social learning in

response to risk so as to sustain social ecological landscapes of human livelihood (communities of practice) in the company of the life-giving processes sustaining the living beings of our finite planet. For this challenging enterprise we currently need to accentuate the provision of all knowledge capital (personal, intergenerational and institutional) within deliberation towards more sustainable knowledge-practices. Steering perspective here needs to be made explicit and socially mediated in continuing critical historical review amidst the more and more daunting questions of sustainability and the resilience of sustainable environments that confront us today. Social learning processes such as these are likely to generate diverse methodological perspectives over single answers.

Notes on the Contributor

Rob O'Donoghue works in the Environmental Education and Sustainability Unit at Rhodes University. He co-convenes a PhD programme and supervises MEd students. Many of the researchers he works with are pursuing an interest in aspects of local and indigenous knowledge, reflexive social change, environmental health and sustainable livelihoods. Email: r.odonoghue@ru.ac.za.

Endnotes

1 The language of sustainable development is picked up in a hollow and somewhat self-referential way that is not easy to narrate as tangible processes of learning and change.

2 A surface reading of ESD as a new idea and a developing turn in the field would be to fall into a similar trap of narrow analysis in the dialectic social politics of the day – an opposing and re-naming that can create a normalising illusion of change.

3 This term is a simple way of depicting waste (rubbish) as a latent manifestation that is accompanied by more hidden problems (risk) in the modern state. See Beck (1992) and Adam, Beck and Van Loon (2000) on risk and 'Risk Society' theory. Also see Engeström (2006) for a probing play on rubbish theory and its extension to humans and humanity as a debris of modernism – a topic taken up by Bauman in his books *Wasted Lives. Modernity and Its Outcasts* (2004) and in *Work, Consumerism and the New Poor* (1998), both studies to be read against his earlier writings on the Holocaust.

4 Here there was a complex pattern of landowners banding together to control their land holdings, notable in the conservancies movement and bioregional stewardship programmes to conserve biodiversity hot-spots on private land.

5 The study does not treat the educative engagement of the public, farmers and children in school as methodologically separate and distinct. Any distinctive pedagogical processes are examined within the broad sweep of educational imperatives in and in response to a globalising modernist project. Without the broader view one might tend to treat the school curriculum or stewardship initiatives amongst landowners as methodologically distinct, losing a sense of how these have developed as diverse imperatives within the modernist project.

6 It is notable that Charon (1995:25) describes Symbolic Interactionism as an approach to sociology that can be traced back to George Herbert Mead and was initially orientated with a philosophy of

pragmatism – an interest that Mead had in the naturalism of Darwin and the behaviourist perspective of the time that assumed humans should be understood in terms of their behaviour. These still resonate with the natural sciences institutional context of conservation education.

7 Here the notion of 'rhetorical marking' (Lotz-Sisitka, 2006) where methodologies conveyed a sense of somewhat hollow ideals or a sense of rhetorical 'movement' that can 'create the illusion of change' (Popkewitz, 1991) was useful for probing idealising turns in emerging social movements.

8 Planned ecological learning experiences were intentionally out of 'sync' with urban lived experience as an intervention to re-orientate the modern mind from a detached to a close engagement in the wilds – a mirror for a more sustainable future. Ecological representations were also abstracted and out of 'sync' with the life experiences of rural youth living within the rigours of poverty, vulnerability and risk in nature. A concern for indigenous knowledge methods emerged here for contemplating how continuities of earlier knowledge practices were disrupted with the advent of colonialism and ecology as a modern capital of detached propositions – now taught without cognisance of or reference to earlier symbolic schemes (cultural capital) that sustained communal social life. Only fairly recently has a concern for situated culture, relational and reflexive learning emerged. Exclusion by abstraction is examined later in the paper.

9 An irony here is that the erection of fences and the exclusion of local people from accessing the natural resources of parks contributed to the rapid rural degradation that gave rise to this reading of the problem from within the parks. Today the sustainable harvesting of the natural capital of parks is still in its infancy as ecological narratives cannot apprehend the environment as social-ecological landscapes and conservation narratives are built on the modelling of natural systems and processes to the exclusion of humans. The current struggle is to reconcile the modelling of natural systems with the nature of human interactions that are sustainable within these, a somewhat paradoxical dialectic since humans were both integral to the creation and a current reduction in the resilience of these. Exclusion and relevance is examined later in the paper.

10 This figure represents the outline scheme (framework) defining and guiding teaching and learning interaction in context. Note how the 3Ts methodological framework has been represented as an overlay of the Symbolic Interactionist process framing developed in the project.

11 In my earlier work in nature centres there was a clear notion of the learners being taught by nature as field teachers had experienced their learning in this way. The embodied experience around which this methodological proposition developed was blind to how a capital of ecological propositions had enabled these meaning-making interactions. Player (1997) ascribes much of his ecological literacy to having been mentored by Magubu Mtombela and the rich indigenous knowledge capital he had derived from his ancestors and a lifetime of living in the bush.

12 These terms are intentionally used in a loose populist sense here to reflect a shared colloquial authority that came with their use in the social politics of methodological narrates within conservation, environment and sustainability education.

13 As noted earlier, the analysis was undertaken with the Symbolic Interactionist propositions of the intermeshed contexts of learning interactions under review.

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Zimbabwe's Better Environmental Science Teaching Programme: A step towards education for sustainable development

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Abstract

This paper appraises Zimbabwe's Better Environmental Science Teaching (BEST) programme within the context of education for sustainable development (ESD). The first part of the paper briefly reviews developments in environmental education in southern Africa within the broader scope and goals of ESD and draws some parallels with the theoretical foundations of the BEST programme. The second part uses ESD lenses to reflect critically on a study conducted in 2005 to assess the practical implementation of BEST in a rural setting in Zimbabwe. The paper concludes that BEST advocates for a kind of education that has attributes for education for sustainable development. However, the practical implementation of BEST does not appear to match these intentions. Teachers, and their supervisors, are still tied to neoclassical methodologies in which teachers know and pupils don't. The examination-driven curriculum prohibits the required re-orientation of education towards an education system that provides communities with skills, perspectives, values and knowledge to live in a sustainable manner. Communities themselves appear to find it difficult to conceptualise their role in the schooling of children in a community context. This research points to the often-quoted rhetoric-reality gap between idealistic policies (such as those being put forward in international ESD discourses) and practice, particularly in structured institutional settings such as formal education systems. The paper argues that for this rhetoric-reality gap to be 'closed' there is a need for a re-orientation of educational philosophy in Zimbabwe, as well as for closer relationships between schools and communities in the learning process.

Background

There is no doubt that Zimbabwe, like most Third World countries, is facing various environmental challenges. These include abject poverty, unemployment and underemployment, hyperinflation, shortage of basic commodities, emigration of skilled people, governance, land degradation, HIV/AIDS, incessant droughts, and many more. These environmental problems are varied and can be categorised as political, social, environmental and biophysical. On the whole, these problems are interrelated. For example, a political decision to implement an economic structural adjustment programme resulted in many job losses; these unemployed people then turned to self-help jobs such as gold panning, urban agriculture and many other activities which have since caused pressure on the biophysical systems, resulting in land degradation, biodiversity loss, and water and soil pollution.

It is in view of such challenges that the United Nations launched the Decade of Education for Sustainable Development (2005–2014). As Zimbabwe joins the rest of the world in considering its response to this Decade, it is necessary to critically review curriculum programmes and find ways of re-orienting them in light of the expectations of education for sustainable development (ESD). In this paper, I use the two terms 'education for sustainable development' and 'education for sustainability' interchangeably, although I am aware that they may not have the same meaning for all people. In the context of this paper, environmental education (EE) processes are seen as a vehicle to achieve ESD, and not as something oppositional or different.

Education for Sustainable Development, Environmental Education and BEST

Education for sustainable development: Meaning and scope

The main goal of the UN Decade of Education for Sustainable Development (DESD) is to make education a key agent for change towards sustainable living. There is no single agreed definition of sustainable development but the World Commission on Environment and Development defines it as development that meets the needs of the present without compromising the ability of future generations to meet their own needs (Pigozzi, 2003). There is also agreement that sustainable development is built on three 'interdependent and mutually reinforcing pillars', which are economic development, social development and environmental protection (*ibid.*:32). International conceptualisation of ESD proposes that education at all levels and in all forms should help people of all ages better understand the world in which they live and the complexity and interrelationship of problems such as poverty, wasteful consumption, environmental degradation, population growth, gender inequality, health problems, conflict, and the violation of human rights – all of which threaten our future.

Environmental education processes as a vehicle for ESD

Earlier conceptions of environment mainly emphasised natural ecosystems, with little attention given to people's relationships with these ecosystems. Early responses to environmental problems thus focused on protecting species in nature reserves and botanical gardens. The assumption was that people needed to be made aware that nature was at risk, and that nature should be protected from people's interference. The educational discourses at the time also reflected the above perception of the environment (O'Donoghue & Janse van Rensburg, 1995). Prominent methods included show and tell, experiential learning, and field trips, among others.

With time, the perception of the environment changed. It was realised that environmental problems have political, social and economic implications as well. People, rather than nature, slowly became central to environmental education methods (*ibid.*).

Critical orientations to curriculum research brought about multiple discourses and contestation over the nature and meaning of environmental education within an emerging discourse of sustainable development. Fien (1993, drawing on earlier work by Lucas, 1979) identified three relatively discrete forms of environmental education, which are education *about* the environment, education *through* the environment and education *for* the environment. Education *about* the environment, which in earlier times was a common form of environmental

education (Robottom, 1987 and Spork, 1990 in Fien, 1993), emphasises knowledge about natural systems and the ecological, economic and political factors that influence decisions about how people use the environment. Within this conceptualisation, the integration of natural and social systems was often neglected in education about the environment.

Education *through* the environment, which was seen to be more learner-centred, aimed to increase reality congruence, relevance and practical experience to learning. Its aim was to provide learners with an appreciation of the environment through direct contact with it (Fien, 1993). Educational approaches develop skills such as data collection, observation, sketching and interviewing, as well as cooperation and group responsibilities (*ibid*.).

Education *for* the environment, as a curriculum theory for environmental education, took account of the educational implications of ideology. Education *for* the environment is neither neutral nor is it value-free – rather, it is a critical approach to education. Huckle, in the early nineties (1991), identified three characteristics of education for the environment, which are:

(1) shared speculation with pupils on those forms of technology and social organisation that enable people to live together in harmony as people and with the natural world,
(2) it is a form of praxis in which teachers and pupils seek to democratically transform society through reflectively constructing and reconstructing their world, and thus
(3) it develops critical and active citizens who are able to bring about the transition to sustainable development.

The underlying assumption here was that learners would be empowered within an emancipatory mould.

More recent deliberations on environmental education have emphasised action-centred orientations within a broad critical orientation. White (2004), for example, defined environmental education as an interdisciplinary and holistic force of education that is geared towards action and change, and which promotes the use of participatory, learning-by-doing and action-based methodologies. O'Donoghue (2001) proposed an open learning framework to assist educators to consider the relationship between action and learning in environmental education. The framework focuses on the relationships between dialogue, encounter and reflection with respect to environmental issues and risks. In a southern African context, processes of mobilising indigenous knowledge have also been foregrounded in environmental education responses (see, for example, Mokuku & Mokuku, 2004; Namafe, 2004; Shava, 2005), introducing a concern for culture, context and epistemological relevance into conceptualisations of environmental education.

All this shows that environmental education processes, which are an established vehicle for ESD, are grounded in social constructivism and socially critical orientations, although, more recently, critical realist discussions have started to question earlier socially constructed foundations of environmental education (Price, 2005). Critical perspectives entail questioning appearances and taken-for-granted practices, probing assumptions and implications (Cornbleth, 1990). Social constructivists believe knowledge is a human product, and is socially and culturally constructed by individuals through their interactions with each other and with their environment (Ernest, 1998; Gredler, 1997). McMahon (1997) adds that social constructivists view learning as a social process that occurs when individuals are engaged in social activities

– and not as a passive development of behaviours that are shaped by external forces. Social constructivists thus see learning in ESD as a cooperative process building on learners' prior knowledge. Learners as well as community members are seen as agents for producing worthy knowledge through interaction with others. Learners and the community can engage in collaborative community projects which are a response to community concerns and which engage learners in collaborative reflection and learning from direct experience. A direct result of these perspectives has been the development of action research and community problem-solving methods, amongst other action-centred methods. Environmental education further encourages interaction amongst learners, between learners and educators, and between learners and community members, in order to address local environmental issues and risks. As can be seen from this discussion, the evolution of thinking in environmental education in southern Africa, has provided a rich capital for implementation of the UNDESD, as environmental education has considered many of the issues currently being proposed to guide implementation of ESD (UNESCO, 2005).

Historical developments shaping the BEST programme

The evolution of Zimbabwe's primary school science curriculum, especially for schools once reserved for blacks, can be traced to the 1950s. In 1954 the Rhodesian government (now Zimbabwe) implemented science in the primary schools as nature study. The curriculum approach was conservationist; the idea was to raise awareness in learners of flora and fauna that were in need of protection. The syllabus was found to have little relevance to the Zimbabwean context, as highlighted in the Curriculum Development Unit report of 1974 (MEC, 1974). In 1975, a working committee of the Ministry of Education recommended that history, geography, nature study and hygiene be integrated into one subject which was known as environmental studies.

Environmental studies was further split into two subjects: environmental science (ES) and social studies. The new environmental science syllabus was produced in 1982. It covered 13 topics, with topic content for each grade clearly defined. The syllabus aimed at developing scientific concepts and skills through pupils' involvement in practical activities.

The Curriculum Development Unit report of 1990 (MEC, 1990) highlighted the problems that were identified in implementing the new syllabus. The problems included timetabling, pedagogical use of local resources, linking out-of-class practical activities with classroom learning, community involvement, and teaching methods that were largely content-centred. From 1990 to 1993 the syllabus was revised to meet the demands of different levels of trained teachers, as well as untrained teachers. In 1994 a bilateral agreement between the Zimbabwean and the German governments resulted in the establishment of the project Better Environmental Science Teaching (BEST) to implement the revised syllabus. BEST was installed with the following aims:

(1) To improve the teaching and learning processes of environmental science quantitatively and qualitatively in Zimbabwe, so that educators and pupils scientifically investigate relevant environmental issues

(2) To enhance sustainable management of the environment by involving the community
(3) To improve teaching and learning in all subjects in primary schools through integration of environmental science with other subjects

As an implementation strategy BEST conducted in-service courses at different levels for the key players in the school system, namely: school heads and teachers, school supervisors and teacher training college lecturers.

It is against this background that we sought to appraise BEST as a curriculum approach within the realms of ESD. The first part draws parallels between the theoretical grounding of BEST and pedagogical orientations that inform ESD. The second part analyses the actual implementation of BEST in a rural setting in Zimbabwe. The analysis is done within the broad scope of ESD, which includes recent trends and developments in environmental education (as outlined above), with the hope of further re-orienting the curriculum practice towards the goals of ESD.

Parallels between the theoretical grounding of BEST and ESD

Parallels can be drawn between the theoretical grounding of BEST and the broad-based goals of ESD as outlined above. The first two aims of BEST call for investigation of environmental issues by learners and educators with a view to enhancing sustainable management of the environment by involving the community. This sounds like a curriculum move from the traditional neoclassical orientation towards a more critical, action-oriented approach in which learners and community members are involved in reflecting on, and reconstructing, their world. Further deductions from these objectives may mean that learners are encouraged to make meaning of their learning. Learning also becomes conceptualised as a participatory process, as it calls for the involvement of both community members and learners to manage their environment. One would expect a kind of learning where all forms of knowing, that is, indigenous ways of knowing and scientific knowledge (amongst others), are at play to enhance sustainable management of the environment. Theoretically, this agrees with the thrust of ESD and recent trends in environmental education (as outlined above), which call for re-visioning and revaluing education so that it becomes process oriented and empowering rather than product oriented.

On paper, one can deduce that BEST advocates for a kind of education that has attributes to achieve the goals of education for sustainability. Attributes such as participative, inclusive and lifelong learning for all persons in all areas of life, extending throughout their lifetime, are assumed (Huckle & Stirling, 1996). Learners, educators and local people would be expected to see themselves, their histories and futures in new ways. They are expected under BEST to develop a sense of power to shape their lives and the environment in which they live (Huckle, 1995).

Theoretically this move agrees well with the constructivists (McMahon, 1997) who argue that knowledge is derived from interactions between people and their environments and resides within cultures. The construction of knowledge is thus influenced by the inter-subjectivity formed by cultural and historical factors of the community. Thus the objectives of BEST would

expect teaching approaches, which include reciprocal teaching, peer collaboration, problem-based instruction, case studies, web quest, fieldwork and many others, that involve meaningful learning where learners are involved in advancing community needs.

The other aim of BEST is to integrate environmental science with other subjects. This is in line with the interdisciplinary and trans-disciplinary characteristics of education for sustainability that reflects that no subject, factors or issues exist in isolation (Huckle & Stirling, 1996). This probably sows the seed of a socially critical curriculum in which the whole curriculum is seen as a project. In this case, differentiation of subjects and use of time should be based on negotiation between community, teachers and learners (Kemmis, Cole & Suggett, 1983). One would expect to see under BEST something similar to a thematic approach where pedagogical practice of every discipline is guided by the curriculum project. For example, if the community is facing a problem of soil erosion and siltation of rivers, all the subject disciplines will focus in time and space on this problem. In geography, learning will focus on related concepts and field activities. History learners and community members may try to harness knowledge from previous generations and from other cultures concerning the challenges. Languages and arts could dwell on related passages, as well as dramatising to enlighten the community on problems and expected corrective measures.

The last aim of environmental science learning that focuses on environmental issues, and involves the community in the actual teaching of environmental science, suggests that learners, educators and local people could be involved in action research and community problem-solving activities (and other action-oriented approaches) to improve their lives.

Appraisal of the Practical Implementation of BEST

To appraise the practical implementation of BEST, a study was conducted in 2005 using indicators such as desirability of BEST as a curriculum project, areas in which teachers find BEST most useful, areas of major focus by supervisors such as school heads and their deputies and education officers, and also teaching methods preferred by teachers, as well as community involvement in curriculum implementation.

For this purpose, a survey was done in Buhera district of Zimbabwe. The district is one of the poorest of the country's rural districts. A rural setting was also seen to be suitable – mainly because rural communities derive their survival needs directly from the biophysical environment, which is facing several pressures, and the sustenance and sustainability of which would require the contribution of community members themselves. Sixty out of 300 primary school teachers in the district were randomly sampled for the study. A questionnaire was administered to teachers. Follow-up interviews were conducted with teachers, as well as with heads of schools. Informal interviews were also conducted with community members. Purposive and convenient sampling strategies were employed to engage with community members who were involved in school activities.

Desirability of BEST in schools

The success of a programme depends on how implementers of that particular programme

appreciate it. Elkana (1978, cited in Marufu, 2003) observed that in North America attitudes have been used in order to estimate the condition of science in schools and in society. In the same vein, desirability would act as an indicator of the attitudes of teachers towards BEST as a curriculum programme.

Table 1. Desirability of BEST in schools (n=60)

Category	Yes	Partial	No	Total
No. of teachers	38	18	4	60
% of sample	63	30	7	100

As Table 1 indicates, 63% of the respondents indicated that they supported the retention of the programme, 30% gave the response 'partial', while 7% rejected the programme. The majority of the respondents who have a positive opinion towards the BEST programme in schools pointed out that BEST requires one to carry out experiments, thus developing scientific skills in pupils. The main reason commonly pointed by those who disliked BEST was that it is too demanding in terms of time and resources such as equipment for experiments. The 30% in the partial category said the programme has some advantages and disadvantages and they still need to learn a lot. Teachers in this category indicated that they face problems in linking practical activities done outside with concept development in class. In other words, such teachers are failing to reconcile the demands of a theory-oriented summative evaluation with practical activities done outside the four walls of the classroom.

We noted that all administrators (school heads, deputy heads and teachers in charge) supported the retention of the programme. The main reason given was that BEST assisted administrators in supervision as it provides them with a framework to supervise their staff. They believe that BEST sets standards of operation in schools.

School administrators also see BEST as useful in schools because it assisted in the running of income-generating projects such as vegetable gardening and poultry. Most school heads felt that BEST provides them with a framework to invite community members to provide seed funding for such projects.

Through BEST, schools can also involve communities to take part in school environmental activities such as tree planting, water harvesting and so forth. As a result, parents have an opportunity to plant different types of trees in the schoolyard. For school heads, this was a milestone in fulfilling BEST's aim of involving communities in managing the environment.

Areas in which BEST was found to be useful

Areas that are covered in BEST programme in-service workshops, and which were found useful in the teaching of environmental science by a number of respondents, are summarised in Table 2.

Table 2. Areas in which BEST is found useful (n=60)

Area	% of Sample
Use of various teaching methods	90
Assessment	80
Development of primary science	80
Scheming	70
Syllabus interpretation	70
Community involvement	22
Integrating environmental science with other subjects	5

All the teachers surveyed indicated that they had attended at least one environmental science in-service course. Generally the courses were considered to be a worthwhile experience. The respondents cited the BEST programme as being useful in a number of areas: 90% indicated that it was useful in teaching methods such as experimentation and demonstration; 80% in developing scientific skills in pupils such as experimentation, and also in assessment; 70% in syllabus interpretation, and in scheming; 22% in community involvement, especially in carrying out a project; and 5% in integrating environmental science with other subjects. Lack of teaching and learning support materials was cited as a major drawback in the teaching of environmental science.

Of notable concern is the low appreciation by teachers of community involvement and integration of environmental science with other subjects. As outlined in the orienting discussion above, these are key aspects of BEST which could enable the teaching of environmental science in primary schools to tackle the problems that bedevil the community.

Follow-up interviews on community involvement revealed that teachers and school heads do not see how villagers can really be involved in the teaching and learning of children. The majority wondered how villagers, who have not received much formal education (Western education), could meaningfully contribute in the learning process in schools. On the other hand, community members themselves are puzzled when schools try to involve them in learning activities. They do not see themselves as having any worth as far as school learning is concerned. As one villager put it,

> knowledge learnt in schools comes from learned people in big cities like Harare, and after finishing school children should proceed to look for employment in these cities. This is how our poverty can be reduced when our children are working and look after us.

To summarise the issue, most villagers believe that their plight is not in their hands but that people should seek employment elsewhere. Jackson (2004) also discovered that villagers in India do not see how village life and activities could be of any relevance to education. Weston (1996:117) calls this 'self-validating reductionism', when people are reduced into something less than they are, or could be. Over the years, colonial governments controlled what should be learned in schools and local people had no say – and this continued after independence.

Because successive education authorities have neglected, taught against and looked down upon indigenous practices such as permaculture, traditional ways of grain/vegetable storage, seed selection, crop rotation and sustainable agricultural practices and others, they have been 'left out' of education systems. However, these are some of the concepts which community members could be introducing into school learning, in a bid to improve their lives in a sustainable manner.

Areas of major focus by supervisors

To develop interpretations of aspects of BEST that are privileged by authorities, teachers were asked to indicate those areas which supervisors (heads of schools, deputy heads, teachers in charge and education officers) concentrate on most during lesson supervision.

Table 3. Areas considered important by supervisors (n=60)

Area	No. of Teachers	% of Sample
Charts and pictures	50	83
Science corner	20	33
Pupil–pupil interaction	17	28
Written exercises	15	25
Learning and teaching aids	10	17
Lesson distribution	10	17
Pupils' displays on environmental science	10	17
Projects on environmental science	2	3

As indicated in Table 3, 50 teachers (83%) reported that during supervision of environmental science lessons much emphasis seemed to be placed on charts and pictures. These could be charts produced commercially or at the school by the teachers themselves. The reasons given revealed that charts were considered to be more useful in delivering information to pupils. Only two teachers (3%) reported that their supervisors placed emphasis on environmental science projects. These would be projects which would involve communities in solving problems that communities face on a daily basis, as discussed above.

Areas emphasised by supervisors seem to be those traditional aspects of education considered important in vocational/neoclassical pedagogy. By putting so much emphasis on charts and written work, supervisors show that they believe the teacher should be the bearer of knowledge which should be transmitted effectively to learners. Charts and other teaching and learning support materials such as those in the science corner, aided by other pedagogical dynamics such as pupil-pupil interaction mostly in smaller groups, facilitate the transmission of this knowledge. Written exercises test acquisition and mastery of what is considered worthwhile knowledge. In the learning process, teachers and learners do talk about the environment. Learners bring samples from the environment and there is an appreciation of problems that the environment is facing, but the integration of school activities and community activities is largely neglected.

Preferred teaching methods

Preferred teaching methods were used to develop interpretations of the philosophical orientation of teachers in the district.

Table 4. Preferred teaching methods in BEST (n=60)

Teaching Method	No. of Teachers	% of Sample
Simulation games	57	95
Demonstration	55	92
Experimentation	28	47
Drama	18	30
Project method	16	27
Field trips	11	18
Problem solving and case studies	3	5

As shown in Table 4 above, the two most preferred teaching methods were simulation games and demonstration. The main reason given was that the methods did not demand too much use of learning support materials as compared to other methods. Drama, field trips, project method and case studies were said to be time-consuming. The choice of teaching methods reflects the neoclassical orientation of most teachers. Demonstration, as a teaching method, does not nurture a participatory spirit. Although it may appear to be a practical method, it remains a largely transmission-oriented 'show and tell' method that does not engage learners in critical, co-constructive, action-oriented ways (Lotz & Ward, 2000, cited in Babikwa, 2004).

Through considering O'Donoghue's open process framework (mentioned above), one can deduce that simulation allows learners to engage in encounters (do something), reflect and discuss what is happening. It is also possible that learners will draw on their prior knowledge and experience and, therefore, to some extent, simulation can make closer relations with community knowledge and experience possible. Such methods seem to be preparing learners to participate in the reform of their society. The methods reflect the liberal-progressive orientations where the role of the school is seen as civilising young ones, preparing them to be socially responsible in improving their lives (Lotz & Ward, 2000, cited in Babikwa, 2004). While this is a worthwhile departure from the traditional neoclassical and vocational approach in which the school perpetuates and legitimates existing social, economic and political structures, it falls short in some ways. The method is less concerned about learners' action and is weak in practical and cultural linkages with the community. The method does not give learners practical hands-on experience in which learners can be involved in action research and community problem solving. The school remains alienated from its community in terms of solving problems.

Follow-up interviews were done to establish why teachers do not prefer practical and outdoor methods such as case studies, project and community problem solving. Most indicated that time was the biggest impediment since they are following an exam-driven curriculum. They have the syllabus to complete in preparation for the examination. Some also indicated that summative assessment seems not to take into consideration practical activities done by learners

during the course of the year. This is why teachers would rather dedicate more of their time to written exercises and other pen and paper activities, which prepare learners for the written examinations that will determine their progress into the next stage of the school system.

Conclusion

The paper has exposed that the theoretical grounding of BEST is in line with the context of developments in the field of environmental education in southern Africa, and with the broader goals of ESD. Some tensions and constraints are, however, visible when it comes to the practical implementation of BEST in schools. As indicated above, these tensions and constraints are seemingly linked to different philosophical foundations underlying the context of BEST, which shape and inform the education system in Zimbabwe. The discussion above also points to the continuity of these philosophies with earlier forms of colonial education.

BEST is based on the premise of social constructivism and socially critical orientations, and aims to strengthen community participation in education. On the other hand, the education system of Zimbabwe is seemingly based on a neoclassical instrumentalist view of education. This approach has created a technocratic mindset that influences the professional character of teachers, and their supervisors. In the technicist approach, knowledge is treated as a neutral tool to be manipulated by the expert educator for the goals to be achieved (Babikwa, 2004). Educators, in this case, teachers from various teacher education institutions, are assumed to have the right knowledge and capacity to conceptualise on behalf of others with whom they work (Usher, Bryant & Johnson, 1997). Hence, teachers are not comfortable to work with community members whom they think do not possess worthwhile knowledge to be imparted to youngsters. Learners are considered as containers to be filled with knowledge, and reality is regarded as static, changeless and predictable (Freire, 1970), a process which Freire described as 'banking education'. Communities themselves appear to have become alienated from the educational system through this process, as they apparently do not see how they can contribute to learning in schools, and instead project their hopes for poverty relief in the external, longer-term outcomes of education, which they link to urbanisation and modernist views of development. This brings little immediate relief to communities, and appears to do little to address the issue of relevance in education in the context of increased poverty, environmental degradation, economic hardship and other sustainable development issues outlined above.

To achieve the broader goals of ESD, which are linked to societal transformation and improvement in the quality of life of people, it would seem necessary to draw on the experience and practice that has been developed in environmental education in southern Africa over the years, in the process of re-aligning the whole education system with ESD goals. Recently, the 1999 Presidential Commission of Inquiry into Education and Training in Zimbabwe (Government of Zimbabwe, 1999) recommended a paradigm shift in education to make it heavily reliant on local context, knowledge, needs and priorities. As argued in this paper, 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 is likely to involve changes in educational philosophy

(see also Babikwa, 2004) and also bring about closer relationships between schools and their communities in the learning process.

Notes on the Contributor

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Environmental Education Policy Implementation Challenges in Botswana Schools

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Abstract

This paper analyses teachers' responses to the introduction of environmental education policy in Botswana's primary schools. The 1994 Revised National Policy on Education introduced environmental education into the education system through an infusion approach. This paper reflects on some of the issues and challenges confronting teachers in interpreting and implementing this environmental education policy. The findings are based on research conducted in four regions in Botswana. Data for this research were generated through interviews, questionnaires and classroom observations, and were supplemented by a genealogical analysis of key documents and interviews with policy makers. A post-structural analysis of the data indicates that various normalising (self governing) strategies were applied by teachers in their policy interpretations. The study also considers how these environmental education policy interpretations are influenced by the construction of the policy discourses, and by contextual challenges emanating from the genesis of the policy, conceptions of environmental education, support mechanisms, educators' experiences and power relations.

Introduction

Education policy reform interventions such as the introduction of environmental education may enable or constrain policy agents (such as teachers and education officers). Policy implementation may cause frustration amongst agents, particularly where constraints far exceed enabling factors. This paper examines teachers' responses to the introduction of environmental education into Botswana's national education system through the Revised National Policy on Education (RNPE) (Botswana Government, 1994), as well as teachers' understandings of the policy text, environment and environmental education concepts. The analysis presented here forms part of a much larger study examining the genesis and interpretation of environmental education policy in Botswana (Ketlhoilwe, 2007). Through an analysis of school profiles, school-community relations, teaching and learning practices, and resources and support services that enable or constrain policy implementation in schools, insight was gained into the interpretation of this policy. These dimensions were analysed to establish how teachers responded to the policy, and what factors were shaping, enabling or hampering environmental education policy implementation in schools. The paper thus provides an analysis of factors that shape pedagogical discourses in schools. It also explains how and why teachers might develop various normalising strategies when confronted by new policy directives, in this case the introduction of environmental education.

The Context of the Study

Botswana education policy implementation is based on, and facilitated through, an administrative structure which operates from macro- to micro-levels. The structure has a bearing on how the institutions operate and influences how policy is interpreted and implemented in practice in the classroom. The policy is designed by the Ministry of Education and mandated to different departments for implementation. For instance, the RNPE statement on environmental education is mandated to the Department of Curriculum Development and Evaluation to 'provide leadership in improving the quality of education through curriculum development, review and revision'. The Department infuses environmental education across the curriculum. It is responsible for syllabus design, monitoring, evaluation, materials design and development, and provides guidelines for policy interpretation for use by teachers and learners in schools. It operates its mandate through a panel of experts that advises on matters related to policy.

The next department in the implementation structure is the Department of Teacher Training and Development, which is responsible for both pre-service and in-service teacher training based on national curriculum development. Once a syllabus is designed and handed over to the Department of Teacher Training and Development, this Department is responsible for making sure teachers are trained and professionally supported. Most of its services are decentralised to 12 educational regions throughout the country. At primary education level the Department provides a regional teacher support service which includes teacher advice.

The Department of Primary Education is responsible for supervision and inspection of all primary schools (Ministry of Education, 2006). However, some of its duties are decentralised and carried out at district level such as school inspection and material supplies. The provision of transport and day-to-day logistics falls under this department. Employment of teachers is the responsibility of the Department of Teaching Service Management, which is supposed to ensure that qualified teachers are employed. It also provides teacher regulations and rules on professional conduct and service. It is responsible for teachers' remuneration and social welfare.

These departments are all supposed to liaise with each other as they operate through one agent (teachers). This symbiotic relationship is meant to ensure that the education system and policy yield optimal results. This form of governance influences classroom practice. In addition to the macro-structure, teachers at school level are faced with contextual and structural conditions within which they operate as agents at a micro-level. There are extra-discursive practices (non-discursive) such as the socio-economic situations/conditions that exert a bearing on the ability of teachers to deliver and implement the education policy statements. Botswana, like other southern African countries, is facing socio-economic development challenges. It lacks financial capital to provide enough classroom space for learners, to offer satisfactory salaries for teachers, to provide adequate teaching and learning support resources, and many of the parents are unemployed and are not able to contribute to cost-sharing principles.

Research Methodology and Methods

A post-structural qualitative research design informed the generation and analysis of data in this study. Post-structural analysis aims at discovering or uncovering the actual patterns of power-knowledge relations that shape actions (e.g., policy development and interpretation in a given context). Specifically, the research drew on Foucault's (1977) notion of governmentality to analyse teachers' interpretations of the RNPE policy. The concept of governmentality examines:

- normalising strategies deployed by teachers to interpret environmental education,
- power/knowledge relations in policy interpretation and implementation, and
- the interplay between normalising strategies and strategies of resistance and interrogates where and how these occur (Darier, 1999).

Of particular interest was the way in which teachers deployed various normalising strategies to interpret the environmental education policy. These normalising strategies were influenced by various contextual factors, and by the macro-level curriculum governance structures as outlined above.

To generate data for this analysis, focus group discussions, questionnaire data and classroom observations were used in five schools in different educational districts in Botswana. The purpose of conducting ***focus group interviews*** was to listen and gather information about environmental education policy implementation from practitioners (teachers). In each school, the focus groups consisted of similar participants, i.e., people with similar qualifications, senior teachers or teachers teaching at the same level, to ensure that interviewees felt comfortable with people like themselves and to identify trends and patterns through the creation of a permissive environment (Kruger & Casey, 2000). ***Questionnaire*** data were used to complement data generated through focus group discussions. The purpose of the questionnaire was to generate school profile data relating to environmental education policy practices, as well as data on teachers' professional contexts and roles and their views on policy implementation. The questionnaire proved to be a valuable tool for triangulating data generated through the focus group discussions. Data generated from focus group discussions and the questionnaire was complemented by ***observation*** in schools. Observations proved to be a valuable technique to generate data on the manner in which teachers were actually interpreting policy in the classrooms.

Profile of the Research Participants

A total of 35 teachers were involved in the research in the four regions. The respondents' qualifications ranged from a two-year Primary Teachers' Certificate, three-year Diploma in Primary Education to four-year BEd (Primary) degree. There was one unqualified respondent (with an O-level certificate) employed on a temporary basis. The majority (18) of the respondents possessed a Primary Teachers' Certificate. Six respondents had diplomas while four had a first degree in primary education. Six respondents did not disclose their professional qualifications. The respondents' teaching experience ranged from 5 months to 30 years. Eight

of the respondents who had graduated in the last 10 years had had exposure to environmental education and infusion. Eleven of those who graduated before 1994 had benefited from in-service workshops or courses on environmental education. Nine of the respondents had never had any opportunity to attend environmental education in-service training in their teaching career.

The purpose of documenting and analysing the above professional profile of the teachers was to establish contextual factors and conditions favouring or constraining the implementation of environmental education in schools, and to shed light on teachers' competencies and associated deployment of self-governing strategies in teaching environmental education.

The Findings: Teachers' interpretations of environmental education policy

At the time the research was conducted (13 years after the introduction of the RNPE and its environmental education clause), there was evidence that environmental education had been infused across the primary school curriculum. In addition, the subject 'environmental science' had been introduced at lower primary level. There were, however, also interesting 'other discourses' that have emerged as teachers and schools have interpreted and responded to this policy through various normalising strategies.

Three prominent normalising strategies were identified in this research, namely: (1) equating environmental education with environmental management activities in schools; (2) expressing frustration with a lack of resources to undertake field trips (i.e., outdoor education expectations) and (3) equating environmental education with environmental science. These three normalising strategies are briefly described below. Further explanation for these strategies is provided through provision of contextual data, and through explaining how the normalising strategies were influenced by the genesis of the environmental education policy within the RNPE development process.

Equating environmental management activities with environmental education in schools
Findings indicated that, in most cases, the status of environmental education in schools is understood in terms of its recognition with activities such as keeping the school clean and the existence of an environmental club or committee. Responses revealed a discourse of cleanliness and environmental management in schools. The respondents mentioned school *cleaning* or *cleanliness* as one of the activities showing that environmental education is given some status in their schools. It was apparent that existence of health and environmental education clubs in schools is also regarded as recognition and appreciation of environmental education. Teachers also illustrated the recognition given to environmental education in their schools by giving examples of activities such as projects to develop the surroundings and a committee which monitors environmental education in the school. Efforts to promote environmental education through environmental management were evident in most schools. For example, school notice boards had vision and mission statements including environmental management activities. Staff rooms and school heads' offices had environmental posters and recycling projects items made from waste material.

The status of environmental education is also measured by schedules of cleaning and litter collection activities. These activities are common across all the research sites and are allocated a particular day during the week, usually Wednesday afternoons. They include everyday sweeping, litter collection and switching off the lights in the classrooms. Some of the activities in schools include planting and watering of trees and flowers, collecting items such as cardboard containers and other waste materials for recycling. These activities are primarily associated with environmental management and have little to do with the environmental education requirements in the formal curriculum. Teachers supervise learners to carry out the environmental management activities, relating them to classroom learning processes or syllabus content. They are part of the school's official duties and its broader or 'hidden curriculum'. In some schools environmental education status is measured by the existence of an environmental action plan and school mission statement. Some indicated that these activities are recognised and supported by School Management Teams (SMTs), indicating that SMTs tended to equate environmental education with environmental management-related activities. In some schools parents are also involved in environmental committees. However, in some research sites teachers lamented that parents and the broader community were causing environmental problems around the schools, making their environmental management activities difficult to maintain, and their environmental education efforts meaningless, due to a lack of continuity between school and community in terms of the environmental management activities. It was also evident that teachers and school heads were putting much effort into the maintenance of this environmental management discourse in schools, leading to new forms of school-community interactions. For example, some schools were undertaking efforts to address the problem of a lack of adequate support from the municipalities in waste disposal, and school heads also mentioned the problem of animals from the village destroying flowers and trees around school grounds.

Resulting from this environmental management work in schools, it was evident that there is an increased level of environmental awareness among learners and educators. Learners were reported to have started relating well to the environment by voluntarily picking up litter and watering the plants and flowers grown in the school every morning without supervision. However, some respondents felt that environmental education is not given the status it deserves as there are problems such as lack of teaching resources, and that most teachers fail to infuse environmental education into subjects. The recurrence of environmental management discourse dominating in schools may be a result of environmental education only being represented in policy texts and not in 'normal' school materials (e.g., textbooks). It is also an indication of how the respondents interpret environmental education and this situation has impacted on epistemological and pedagogical discourses in the schools. It seems that this normalising strategy has created a discourse that situates environmental education 'outside' of the mainstream curriculum where it is meant to be infused, and situates it more in the realm of the extra-mural and hidden curriculum.

Expressing frustration about a lack of resources for fieldwork (outdoor education)

Frustration about a lack of resources for fieldwork reflected that teachers frequently equated environmental education with fieldwork and excursions. Lack of transport was repeatedly

identified as a barrier to successful environmental education in schools, and was attributed to strict government regulations surrounding use of transport. Transport arrangements in primary schools are made through the district office and vehicles are limited to taking learners on short-distance excursions. Even for distant excursions vehicles are booked some months in advance with no guarantee that schools would be successful in using this resource, as there are many schools in each district and region. Therefore the schools normally have to rely on privately hired transport through parents' contributions, which is problematic for poor parents. Another problem mentioned by respondents as a constraint was lack of funds to finish projects. This problem was raised by one focus group although in some groups lack of funding was associated with prohibiting outdoor education/trips. The implication was that where direct exposure is necessary teachers are constrained by lack of financial resources to take learners to areas of educational interest. Most of the above-mentioned constraints are structural factors affecting the wider education system and environmental education policy implementation as desired and interpreted by teachers. Normalising environmental education policy through equating it with fieldwork also had epistemological and pedagogical consequences. This normalising strategy reflected teachers' concerns that learners were not adequately exposed to direct experiences. This apparently 'forces' teachers to provide learners with classroom-based lectures instead of fieldwork and experiential learning opportunities, and teacher discourse reflects a belief that lack of experiential learning opportunities may lead to weaker correlations between attitudes and behaviour. However, attitude-behaviour relationships are more complex than predicted by the participants in this research. O'Donoghue and Lotz-Sisitka (2002) commented that behaviour change involves complex social processes which require additional analysis that need to take account of culture and *habitus.*

The normalising strategy equating environmental education with fieldwork, like the environmental management activities reported above, appears to lack sophistication of interpretation in relation to ever-increasing complexities associated with people-environment relations in an African context, as described for example by the United Nations Environment Programme in their African Environment Outlook (AEO) report (UNEP, 2006; Lotz-Sisitka, this edition). Environmental issues in the AEO report are, for example, described in terms of poverty and health concerns, globalisation issues, local and global spatial complexities, Africa's development potential and the multi-disciplinary nature of these issues.

Equating environmental education with environmental science

A third normalisation strategy applied by teachers was evident in the way that most teachers equated environmental education to environmental science. Environmental science was introduced through the 1994 RNPE that introduced environmental education. As environmental science deals with environmental content, teachers who may not have had adequate training associated this science-based subject with environmental education, thus narrowing the scope of environmental education to environmental science. Most of the respondents claimed that the objectives and content of environmental science and environmental education are similar, reflecting a poor understanding of the infusion concept and process into other subject areas. For example, there was little evidence of teachers considering environmental perspectives in social

sciences and other subjects such as mathematics. The result was a science-based interpretation of environmental education being dominant in the schools, with much of the content and activities being nature-based (e.g., focused on plants and animals, but more from a science perspective). This normalisation strategy served to marginalise other possible environmental education curriculum discourses such as the social and historical origins of environmental issues, the economic and technological dimensions of environmental issues and risks, and integrated problem-solving strategies or issues-based approaches.

The normalising strategies discussed above illustrate the self-governing techniques (Foucault's governmentality) that teachers used to govern their engagement with the RNPE and the introduction of environmental education policy. The normalisation strategies illuminate the spaces that teachers feel comfortable with when describing their environmental education practice. As indicated above, these strategies appear to be narrowing the potential for broader, more complex engagements with environmental education in Botswana schools. While it is useful to identify these normalising strategies, they cannot be fully understood without an understanding of their genesis. A number of influences appear to be significant in the formation of teachers' interpretations of environmental education dimensions of the RNPE, as discussed below.

Tracing the Genesis of These Interpretations of Environmental Education Policy

Tracing the genesis of these interpretations revealed a mix of historical and contextual factors that shaped, constrained and led to the emergence of these normalising strategies. These are discussed briefly below:

Factors related to the genesis of the policy

Influence of international discourses: Environmental education policy construction in Botswana was a complex process encompassing both national and international environmental policy discourses. Influenced by the rise of environmental education discourse in international events, the Botswana educational community drew on UN initiatives such as the 1992 UNCED conference influencing member countries to re-orientate their education system to incorporate environmental awareness and training. A number of international organisations influenced the Botswana policy construction process, particularly through the intergovernmental agreements. Donor organisations with a strong presence in Botswana such as USAID, and other international projects such as the SADC Regional Environmental Education Programme's work also influenced the policy construction process. Since 1992 there has been an increased emphasis on sustainable development discourse in international policy, and the Botswana environmental education policy reflects this influence in the sense that it is constructed with both: conservation discourse (promoted by the conservation sector in the policy construction process, and the history of conservation emerging from the colonial era); and sustainable use discourse (promoted by donor-funded programmes supporting community-based natural resource management and other environmental management activities) at the time of policy

construction. This led to the existence of a hybrid environmental discourse in the RNPE and associated syllabi, namely, a conservationist and sustainable use discourse, each with a different history. Neither were explicit or clarified, but remained implicit.

Influence of national players: National key players in the policy construction process included non-governmental organisations, and individual and government agencies. These key role players initiated the introduction of environmental education. Non-governmental organisations such as the Kalahari Conservation Society and Wildlife Clubs of Botswana played a leading role by lobbying government, introducing environmental education into schools through clubs, environmental management projects, fieldwork opportunities and teacher training, and through suggesting that environmental education should be incorporated into the education system. Their call for the introduction of environmental education into the education system was answered through the 1994 RNPE policy process in which they participated actively.

As mentioned above, construction of the environmental education policy was influenced by environmental discourses that were dominant amongst key role players. For instance, the Department of Wildlife and National Parks (DWNP) promoted a primarily conservationist discourse, promoting this through environmental awareness/education activities in schools through the formation and activities of the Wildlife Clubs. With the introduction of environmental management discourses (through, for example, a School Environmental Policy and Management Planning initiative), their activities increasingly included an environmental management discourse (e.g., school grounds cleanliness, water conservation), and field visits/trips. In addition, the Department introduced and supported mobile in-service teacher training workshops. The DWNP became a dominant force in the construction of the RNPE policy and conceptualisation of environmental education. The mobile workshops seem to have given the teachers the idea that fieldwork is a particularly important environmental education process. As indicated above, teachers' interpretations of the policy revealed that they were particularly influenced by the activities of the Department of Wildlife and National Parks and Association of Wildlife Clubs of Botswana.

Contextual factors

Teacher training: Teachers' interpretations of environmental education and its construction as environmental science were also linked to a lack of adequate teacher training and support, indicating that teachers' interpretations of policy, and associated normalising strategies, can be influenced by contextual factors. Twelve respondents indicated that they had never been involved in any environmental education in-service training. Those that had, indicated that they had been involved in a 'crash course' on the revised curriculum that included environmental science for lower primary. Some had come across environmental education in college or university courses. Teachers generally reflected that their teaching and interpretation of environmental education had improved because of training workshops on environmental education, although these were not necessarily well run, as teachers complained about getting too much material, with not enough opportunity to develop thorough knowledge of a few things.

School management: Some respondents also felt that school management is not supportive at all. They claimed that they are never given any new information or training on environmental education. However, some respondents explained that their school management is constrained by lack of funds to demonstrate its full support. For instance, these schools cannot purchase resources, equipment or finance educational tours because of lack of funds. And in those cases where support was evident, it often compounded and extended the normalisation strategies outlined above. For example, in some schools, school management was credited by some of the respondents for setting up environment committees, allocating teachers to duties related to the environment, encouraging environmental activities, observing environmental days, supporting the environmental education club in school and organising school-based workshops to equip teachers with the necessary skills, reflecting a continuity with the environmental management activities discourse. Poverty and the socio-economic status of parents also influenced interpretations of environmental education policy, as outlined in the discussion on transport and fieldwork above.

School-community relationships: School-community relationships also appeared to influence the policy interpretation process. Some of the respondents reported good working relations with the community in response to school environmental problems. For instance, one respondent explained that every term they do a clean-up campaign. The parents come to school on Tuesdays to assist with the cleaning of the grounds. Community volunteers also do activities in the school, like cooking for children, particularly during sports and music competitions. Some schools also contribute to the communities by picking up litter outside the school fence and participating during national clean-up campaigns. In one rural school, parents contributed money to buy bricks for building a water tank for water harvesting and for watering trees and vegetables in the school garden.

The study revealed that some teachers were worried about the link between what they teach in the classroom and what the learners experience outside the classroom in the community. Teachers expressed concern that the learners accept their experiences at school as appropriate only at school, compromising the value of environmental education in social transformation. This reflected a concern about the school and its order of discourse and the non-complementary relationship with what is actually practised outside school. The issue of the community-school role in children's environmental education and associated values is influenced by social circumstances and presents a new site of contestation and struggle in schools as teachers attempt to extend the teacher-learner position and influence to teacher-parent-child position and influence.

Learning resources: Environmental education policy interpretation is also shaped by a number of constraints in the classroom and/or school context, key amongst these being inadequate teaching and learning resources. Lack or shortage of materials may lead to lack of or limited information. Teachers were concerned about shortages of resources, particularly reference books and textbooks, and indicated that a shortage of reference books hampered their ability to find out more about environmental issues, which may also help to explain the lack of more

complex, multi-disciplinary environmental education discourses amongst teachers. In some cases there were not enough resources for big classes. Not only were teachers concerned about *quantity* and *availability of material*, they were also concerned about *quality.* They were particularly concerned about the lack of depth in relation to environmental education in the recommended books. Core and supplementary books are recommended by a panel from the Ministry of Education. This form of power and control over knowledge resources prescribed by the Ministry of Education featured across the research sites. Teachers also mentioned that they sometimes struggle to find relevant information to achieve the objectives as stated in the syllabus, especially relating to 'new' issues such as environmental issues. This situation implies that, although the respondents may value environmental education, they are constrained by lack or shortage of learning resources to participate fully in the production of knowledge associated with the implementation of environmental education.

Syllabus construction: Teachers also noted that some objectives in the syllabi are not clear and need to be revisited. The respondents associated this problem with lack of representation of primary school teachers in the design of primary education syllabi. The respondents felt some objectives are not clear because they were designed by subject experts. They also mentioned that the language used is difficult for children to understand. This issue presents a direct challenge to a technicist/expert curriculum design approach where there is little representation of classroom teachers with rich experiential knowledge of how learners learn new concepts. Lesson observations revealed a dominance of prescribed syllabus content, and modes of delivery and predetermined epistemes structured within a *technocratically designed syllabus*. Classroom discourse did not, for example, promote intergenerational or eco-justice perspectives on the viability of natural systems and their use, but was confined to scientific forms of classification, description and naming of plants, animals and other natural system features.

Language: It also emerged that teachers are confronted with complex language and concepts in the policy text and environmental education material content in their teaching. Some interviewees felt that the language used in the syllabus and in the textbooks created a problem for teachers and learners. The respondents revealed that the syllabi are written in English even for Standard 1 learners and it is not easy to translate some of the terminology and concepts. Some of the terminology used is perceived to be above the level of the learners. One interviewee reported that sometimes the teacher never knows whether she/he is advancing or confusing the children more or whether the translation and interpretation is exactly as in the syllabus. These uncertainties amongst some of the respondents indicate that they still lack confidence in teaching environmental education. Respondents still find environmental concepts (and terminology) a challenge to their competencies. Their understanding of environmental concepts needs reinforcement to restore their confidence. This provides evidence of teachers' reflexivity in assessing their own knowledge and competencies, reflecting some ethical values in their profession.

The use of complex language/terminology in the syllabus and books could be attributed to the mode of curriculum design and procedures. The respondents cited lack of primary school

teachers' involvement in the design of the curriculum for primary levels. The curriculum designers who are reproducing and interpreting the policy objectives take for granted that the concepts they use will be clear to teachers and learners. This technique of marginalisation (and silencing) results in a technocratic or expert-led curriculum product, which is reproduced in material design. This challenges human agency in practice as the agents of transformation (primary teachers in this case) struggle with interpretation of the curriculum statements, objectives and language used in the books to communicate and guide the learners. As a result some respondents are unable to help their students to understand the environmental concepts and how they contribute to degradation of the environment. The forms of knowledge that can be communicated through scientific terminology also tend to hide the environmental episteme encoded in the language that appears in the books or curriculum documents.

Ironically, the problems experienced with language and terminology, together with the lack of available learning resources, tended to lead to explanatory teacher-centred pedagogical practices that negated or even worked against the learner-centred, constructivist view of learning that assumes that learners 'construct their own conceptions of their world' as they fail 'to take into account the meta-schemata encoded in the language processes that are the basis of thought, communication and behaviour' (Bowe, Ball & Gold, 1996:148), and learner-centred objectives as proposed in the policy and syllabi were not really met.

Discussion

Despite the finding that teachers appeared to have a great interest in environmental education for its practical value and local relevance, teachers were not adopting practical approaches beyond the school-based environmental management activities such as cleaning up classrooms and the surroundings. Through normalising strategies, it seems that teachers are able to exercise their reflexive power in structuring their experiences. For example, teachers in this study apparently wanted to teach environmental education, or at the very least felt obliged to do so, and in the face of constraints associated with interpreting and teaching the syllabus requirements, and other contextual constraints, they chose to do something related to the environment, most notably environmental management activities in school grounds, environmental science lessons, and the planning of fieldwork (which seemed difficult to execute). These strategies all seemed to fall within the realm of activities that were possible, were supported by the SMTs, and were consistent with broader perceptions of what environmental education might be (i.e., better environmental management, environmental science and fieldwork). They all reflected a localising of environmental education discourse, and there was little evidence of teachers, for example, examining local global relationships associated with environmental issues and risks, or longer-term historical perspectives, or more complex multi-disciplinary perspectives.

This paper has revealed that these interpretations of policy are related to a complex range of factors, which include international and national power-knowledge relationships in the construction of policy discourse, and local power-knowledge relationships that influence local interpretations of policy discourses. Adequate resourcing of new policy initiatives also rises to the surface through this analysis, being a manifestation of the power-knowledge matrix that

exists at the interface of global historical factors such as colonial intrusion and post-colonial state formation, state resource allocations and national priorities, between different levels of the education system and structure, and how it is managed, set up and run, and what priorities are attended to within these structures. Clearly the training of teachers and the resourcing of environmental education have not been seen as a major priority since the introduction of the RNPE, as teachers reported varied levels of support from School Management Teams, subject advisors and the inspectorate. However, administrative and professional support has been credited in some schools indicating that this support is not entirely lacking. Much support for environmental education is still provided by the other national players such as the DWNP, which leads to a continuity of prominence in the conservation/fieldwork/environmental management discourse that is prominent in interpretations of environmental education policy in Botswana.

Teachers' concerns for high-quality teaching and learning resources to help them access broader and more complex knowledge resources than those available at the local level, provides evidence of teachers reflexivity in reviewing their existing environmental education practices. There are indications that they are not satisfied with having to rely on their prior experiences and interpretation of syllabus objectives, and that they are having to improvise to make their lessons successful by employing various teaching techniques. Some were doubtful of their correct interpretation of the syllabi objectives and the way they were implementing environmental education. However, some teachers appear to be positive and recognised the local relevance and value of environmental education but due to contextual challenges they have deployed normalising strategies that emphasise environmental management activities and treat environmental science and science as environmental education. As shown in this paper, teachers' policy understandings influence epistemological and pedagogical practices.

The respondents (i.e., policy agents/actors) are not openly opposed to the introduction of the environmental education policy but are not always ready to admit that they do not fully understand what they are required to do. The equating of environmental science with environmental education and the complaints about in-service training indicate that there is a need to further clarify the environmental education discourses embedded in the RNPE. It may be equally important to clarify syllabi instructions and support translation of these into meaningful and broader teaching and learning processes (not only environmental management activities and field trips). One could therefore agree with some of the respondents that they need in-service training. An examination of the respondents' and schools' contexts indicates a mixture of an ideal and a hostile situation in the implementation process – making for a complex implementation context and diverse and often ambivalent normalising strategies. The respondents have employed various techniques of resistance and compliance. It was only through careful analysis of their responses that conclusions can be drawn that some were deploying techniques of self-governance and normalisation in expressing their experiences, feelings and perceptions about their teaching and competencies. Of significance, and as evidenced through the localisation of the policy discourse, most of the respondents found the introduction of the policy valuable to the children and the community, despite logistical and professional problems experienced.

It also became clear in this research that teachers still rely heavily on textbooks and external knowledge resources instead of other strategies (except fieldwork) to enable development and application of knowledge. It seems that curriculum guidelines are inadequate for the selection of appropriate content to achieve the set outcome without detailed and specific or prescribed textbook content or information from other learning resources, indicating the strong influence of textbooks in governing teaching practices. This indicates that much effort needs to go into high-quality and more flexible approaches to resourcing environmental education processes if they are to broaden, deepen and improve in quality.

Teachers are expecting linear progression of pro-environmental knowledge leading to environmental awareness and concern (environmental attitudes and behaviour change). This rationalist model assumes that educating people about environmental issues would automatically result in more pro-environmental behaviour, which has been termed a (information) 'deficit' model of public understanding and action (Kollmus & Agyman, 2002:3). This indicates that more attention needs to be given to supporting teachers to develop deeper understandings of social change processes in environmental education teacher education programmes. This emphasises the pedagogical dimensions of environmental education processes, which also include normative issues (e.g., the consistency of actions inside and outside the school), as this study identified that community/public behaviour is creating tension with the expected pro-environmental behaviours of learners.

Conclusions

This research into environmental education policy interpretation has illustrated the complex relationships that exist between policy construction and interpretation and has illuminated how both the genesis of policy, and a variety of contextual factors, shape policy interpretations. The research revealed that teachers tend to employ various normalisation strategies that are located in existing experience and discourses that have localised to school level as shown by the influence of the DWNP work. Nevertheless, teachers are also reflexive of these normalising strategies, and can identify the challenges and constraints they face, as they implement these strategies. These include varying degrees of structural factors that are constraining or enabling. This research has revealed that among these factors are hierarchical structures, both in schools and the national education system, insufficient time and lack of transport for outdoor activities, limited learning and teaching resources, large class sizes, complex terminology in the syllabi and textbooks, lack of external support, e.g., from local education authorities, and attitudes of some colleagues and parents. These constrain teachers' classroom practice and hence their capacity to achieve policy implementation in practice (as they may desire it and/or as the syllabus might require). This would seem to indicate that in future policy construction processes, it may be important to take greater account of contextual factors, and that a comprehensive implementation plan may be made a necessary component of policy processes. However, some of these structural constraints emerged as enabling structural factors. For instance, some respondents mentioned support from the Department of Wildlife and National Parks providing transport and talks to their students, support from School Management Teams, Parent Teacher Associations and school heads. Despite

constraining factors, the respondents placed great value on the introduction of environmental education in the curriculum, particularly with regard to its practical value and ethical concerns.

Of significance to the development of further implementation support for environmental education policy in Botswana is teachers' reflexive self-awareness of the way in which they are normalising environmental education as fieldwork, environmental management and environmental science. They blame this on a lack of adequate in-service teacher training, resources and support, indicating an awareness of the potential to develop broader professional competence and institutional support for the implementation of environmental education. This illustrates that the reflexivity associated with teachers' normalisation strategies can potentially be a site for opening up opportunities for future teacher professional development and growth that are situated in, but not limited to, teachers' existing experience and knowledge of environmental education.

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Viewpoint
Botanic Gardens and Place Identity: Informing a more relevant educational practice

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Abstract

Botanic gardens through their history and time-honoured practices have become significant holders of place meanings and are often at the centre of cultural landscape issues across the globe. Botanic gardens, especially in the colonial world, now face the challenge of implementing a more relevant course of action that focuses attention on livelihood and environmental justice. The Durban Botanic Gardens is a case in point where these processes are being actively explored through the Garden Window Project. However, this project requires a new approach for actively and meaningfully engaging with people-plant relationships; one that relies on place associations, narratives and the manner in which plants and place identity provide meaningful learning opportunities for people.

Introduction

> Most interpretation is aimed at visitors from outside the immediate area. But involving local people in thinking about what makes their place special, and how they might tell others about it, can help them find a new sense of pride in their own area. For some projects, this may be the most important thing of all, and any actual end product only secondary. (Carter, 2001:8)

The Durban Botanic Gardens is located within the city of Durban, in walking distance from a major transport node, Warwick Triangle, the site of one of South Africa's largest traditional medicinal plant markets. The 'Gardens' is currently the oldest surviving botanic gardens on the African continent. Established in 1849, the Gardens was developed with the express purpose of experimenting with potential agricultural crops (economics), and served as a botanic station supporting the movement of economics throughout the colonial world (McCracken, 1996).

Background

This paper is based on some research conducted at the Gardens, in the context of the Garden Window Project. The Garden Window Project aims to develop the Durban Botanic Gardens as a multi-purpose service hub in which visitors to the Gardens will be able to personally connect, in various ways, to plant-related programmes (urban greening, medicinal plants and food gardens) represented in the city, in order to appreciate more fully the vital role that plants play in our lives.

A total of 28 interviews were conducted over a three-month period. Respondents included people who were employed, volunteered or visited the Gardens on a regular basis. The study aimed to investigate and understand how issues of place identity and cultural landscape function at the Durban Botanic Gardens. This paper aims to explore the features of place identity and the cultural landscape evident at the Durban Botanic Gardens as way of directing its interpretation/environmental education programme. This is particularly important given the local environmental context in which the Durban Botanic Gardens is located, i.e., in one of the world's fastest growing cities with a range of social development issues: poverty, unemployment and HIV/AIDS. These issues are juxtaposed amid the city's rich natural and cultural heritage.

Places are more than just physical spaces occupied by people. Rather, they are better understood in a phenomenological sense, as dynamic and layered holders of meaning(s) for the various groups of people associated with them. Place need not be just a bounded physical space (in fact one is more likely to discover that the boundaries of places are porous, 'bleeding' with meaning(s) and influence); imaginary places like physical places shape our identity and we, in turn, through our own subjectivity, socially construct the places of significance in our lives. This experience, or sense of place, is constructed on the basis of a number of 'elements' or modes of interpretation as suggested by Galliano and Loeffler (1999): 'Sense of place is a combination of elements that according to cultural geographer Ryden (1993), includes four essential qualities: personal memory, community history, physical landscape appearance and emotional attachment' (p.2). Cultural landscape is that which is 'value laden', possessing an 'identity value', hence meaningful and considered worthwhile preserving (Arntzen, 2002).

The Durban Botanic Gardens, by its history alone, is a 'time thickened' place within the Durban cultural landscape (Crang, 1998). The Gardens as a significant place is imbued with meanings layered in the tradition of horticultural and social practice that both serve and link various cultural groups (some previously excluded) both locally and globally. The Gardens can be viewed as a 'hybrid' space, reflective of societal attitudes, values, perceptions, and knowledge of plants and their relationships to people. Botanical collections are more than just assemblages of select groups of plants in a bounded physical landscape. Rather they represent much larger ambitions and politically motivated narratives linked to people-plant-environmental relationships.

Botanic gardens can also be regarded as 'palimpsests' or places in which select societal values have come to be readily expressed, discarded or upheld over time. Places are the 'fundamental means' in which we interpret the world around us and pursue action. Our identity is located in places, informing us of who we are and how we should behave. The result is an ongoing social construction and reconstruction of places (Cheng, Kruger & Daniels, 2003). Places are given meaning through action. Place is always made through the action of doing 'through everyday processes of participation' (Mackenzie, 2004). The result of human doing and action in place is the build-up of layered cultural meanings over time. It is only in place that culture can exist and be manifested.

Tuan (1974) provided an explanation of place as a concept linked not just to 'position in society' and 'spatial location', but rather one associated with spirit and personality: '…places, like human beings, acquire unique signatures in the course of time' (Tuan, 1974:233). It is this 'personality' that may command awe or evoke affection. Tuan's places are 'non-directed

homogeneous spaces', having a 'stable existence', and are recognised as public spaces and/or 'fields of care'. These qualities are expressed in landscape icons such as monuments, which add significance to a locality, transforming it into a place, and making the locality a 'centre of meaning':

> All places are small worlds … Places may be public symbols or fields of care, but the power of the symbols to create place depends ultimately on the human emotions that vibrate in a field of care. (Tuan, 1974:243)

Extracts from the Research Results: Place-based narratives

A number of themes emerged in the narratives from the various people interviewed, and the data selected for use in this section highlight and share some of the insights gained into two of these themes.

Botanical nationalism

One fascinating issue that emerged in the above research was the notion of 'botanical nationalism', a concept which suggests that plant collections are not neutral assemblages of plants but represent certain single-minded foci that are reflective of a nationalistic agenda. In the same manner that statues and monuments may kindle nationalistic fervor, specialised botanic gardens such as Kirstenbosch develop feelings of national pride. For Osborne (2001), place and identity may be intentionally manipulated or socially constructed to create national identity in the iconography of monuments and elements of national heritage, as reflected in the following narrative:

> RES 5.: [T]he South African trend at the moment which is essentially what I think one could call botanical nationalism, which has all the faults and the advantages of nationalism… Botanical nationalism goes further because what worries me about it, is that like all ideologies, it tends to become cliquish and it tends to become exclusive and because of that it creates a them and us and I think that is unhealthy.

The sense of identity associated with the Durban Botanic Gardens, and especially in light of the above concern about what has been referred to as 'botanical nationalism', is indicative of the manner in which place meanings serve to create a notion of *othering*. According to Cheng *et al.* (2003), 'Identity is a powerful behavioural influence, for the process of distinguishing oneself from others lends meaning and order to an otherwise chaotic world …' (p.93).

Sense of ownership

The Gardens, because of its history, botanical and social traditions, is a prime example of a place where sense of ownership is made strong through long-term association, and in some cases extended from generation to generation within the same family of visitors. The Gardens

has been linked to significant events in the life of the following visitor who, through the effects of apartheid, was forced to move along with his family away from close proximity to the Gardens. However by that stage the Gardens had already served some major milestones in the respondent's life allowing him, despite all the hardship of forced removal, to 'claim ownership of the Gardens'. According to the respondent he has been visiting the Gardens for the past 60 years!

> RES 18.: I sort of uh claim ownership of the gardens you know…not legal ownership but I, I feel that I've have been here for so, I've been through the gardens for so many years that uh I may be part of it… almost my entire life has been spent here uh all be it for a few periods, you know: playing as a child, coming again as, as a high school student, coming with uh, with uh girlfriends, coming again when, when I got married. Even though I've come at very isolated times…I still feel that I uh, I own part of the Gardens…And of course because I was, I was born in the, around the corner and I lived my entire, twenty one years…over here and then after twenty one years old I, we were moved to Sydenham because of the Group Areas Act but I spent the uh greater part, of most of my childhood just around the corner.

Place Identity and the Planning of Interpretation/Environmental Education Programmes

According to Carter (2001) interpretation is an integral part in promoting special places such as monuments, old buildings, a historical event, etc. Without interpretation it may be difficult for a visitor to feel the significance of a site such as a battlefield. Interpretation therefore uncovers the significance of special places, the sense of care for a particular place, and aids in unlocking the identity of particular places.

Interpretation is a means of accessing our heritage and uncovering hidden narratives that reside in special places. Freeman Tilden (1977), the first to publish on the subject of interpretation, aimed to move people beyond simply being told and knowing the facts about a place to developing a sense of value for significant places and internalising a sense of care that could motivate the need to help conserve important sites. This has significance for environmental education practice by allowing various groups of people to contribute fresh ideas about a place, provide new insights, as well as new ways of looking that serve to invigorate special places such as botanic gardens and in turn provide visitors access to an authentic place experience.

Conclusion

The Durban Botanic Gardens possesses a unique place identity, given the traditions and cultural landscape practices that have come to be represented in the artifacts and practices of the place. As a place considered stable and 'time thickened' through years of practice and sentiment, the findings show that despite past exclusions, Indian and African people in Durban still

developed a sense of place identity at the Gardens. The proposed Garden Window Project has the potential to embrace the integrated social changes envisaged by the city of Durban. It is therefore appropriate that a place-based approach is applied in order to foster a new culture of relating through plants to the needs of local communities. This will ultimately aid in developing a more meaningful public horticulture and environmental education programme.

Notes on the Contributor

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Heila Lotz-Sisitka & Rob O'Donoghue, Rhodes University, South Africa & Ian Robottom, Deakin University, Australia

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Martin Clement, South African National Biodiversity Institute, South Africa

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