ECOLOGICAL INTELLIGENCE

viewing the world relationally

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> *The shape of the global future rests with the reflexivity of human consciousness – the capacity to think critically about why we think what we do – and then to think and act differently.* (Paul Raskin 2006)

If we want the chance of a sustainable future, we need to think relationally. That's it, full stop. No need to write any more...or there wouldn't be, if it was that obvious. It's because we *don't* think in a relational way that we need to explore why we don't, how we can, and what it means. The world is increasingly complex, interdependent and unsustainable, yet conversely, the way we perceive, think, and educate tends to be fragmentary and limited, and we tend to live 'like there's no tomorrow'. Addressing this mismatch requires developing competencies in systems thinking, critical thinking and creative thinking, but it requires something more fundamental and challenging besides: no less than our becoming 'conscious agents of cultural evolution' (Gardner 2001: 206) towards a more ecological culture and participative worldview, consistent with and able to address the highly interconnected and endangered world we have created.

Worldviews are 'epistemological structures for interpreting reality that ground their picture of 'reality' in their own construction' (Milbrath 1994: 117). The contemporary challenge is to transcend our self-referential constructions, recognizing that the increasingly pressing sustainability problems we face are rooted in the dominant underlying beliefs and worldview of the Western mind, which, according to Clark (1989: 472) has grown 'maladaptive' (see also *Beauty as a Way of Knowing,* this volume). Rather, we need to move towards an ecological or 'participative' consciousness - or what Raskin et al (2002: 91) call, a 'strong ecological sensibility'- supporting a culturally shared ecological intelligence that is now well overdue (despite welcome and growing signs of its emergence).

This chapter provides some outlines of the meaning of ecological thinking and consciousness - as a response to the limits of the modernist worldview - and touches on the implications this has for education and learning. There is a need for 'relearning on a grand scale', which should be 'a core part of learning across society, necessitating a metamorphosis of many of our current education and learning constructs' (Williams 2004: 4).

First, let's look at terms. Why ecological? One meaning of the term is reflected in the science of ecology. But at a broader level, the notion of an ecological worldview and sensibility arises from the identification of *ecology* as an ontological metaphor, to contrast with the underlying

Newtonian metaphor of mechanism which informs modernist thought (see *Being-in-the-World*, this volume). There has long been tension between the dominant *mechanistic* and the alternative *organicist* ways of viewing the world. As Capra (1996, 17) states:

> The basic tension is one between the parts and the whole. The emphasis on the parts has been called mechanistic, reductionist or atomistic; the emphasis on the whole holistic, organismic, or ecological.

Since the 1960s, Sachs (1999: 63) suggests that, 'The scientific term [ecology] has turned into a worldview. And as worldview, it carries the promise of reuniting what has been fragmented, of healing what has been torn apart - in short of caring for the whole.' Notice that Sachs invokes caring here. So ecological thinking – reflected in ecophilosophy – is essentially relational or connective thinking, but it's also more than that: it is ethical, valuative, and expresses our humanity. In my doctoral thesis (Sterling 2003) I made a distinction between systems thinking and ecological thought, because while ecological thinking is systemic (relational), systems thinking is not necessarily ecological. Systems thinking can be used as a methodology for anti-ecological, as well as ecological, ends. Yet at the same time, systemic thinking can help sow the seeds of an ecological worldview, it can help facilitate the critical reflexivity - or deep questioning of assumptions - that Raskin (quoted at the start of the chapter) advocates (see *Systems Thinking*, this volume). This is important because, as the eminent anthropologist Bateson (1972: 461) said years ago, we are 'governed by epistemologies that we know to be wrong'. That is, while we may be aware of the limits of reductionist and objectivist approaches and instrumental rationality, at both a deep and practical level they still tend to inform our perception and thinking – and much educational policy and practice (Sterling 2001). Through experience of the latter, educators and learners tend to be good at:

- *analysing* things - but less good at thinking 'out of the box', and at synthesising things
- *categorising* and *labeling* things (this is a 'health issue', an 'economic issue', a 'social issue' or an 'environmental issue', for example) – but less good at seeing the interrelated nature of the reality that often lies beneath the convenient label
- *seeing detail* and dealing with parts – but less good at appreciating overall patterns in events, in organisations, or other phenomena.
- *focusing in* on one factor or one goal (e.g., maximising a particular achievement, increasing productivity, or maximising profits) – but less good at recognising and balancing multiple factors and goals (Sterling 2005)

This is a kind of lop-sided competence, which is largely blind to relationships in both descriptive and normative terms (i.e., what is, and what should be). Getting beyond this depends on self-reflexivity, whereby dominant assumptions are brought to light for examination. I suggest such assumptions can be outlined as follows:

1) 'To every problem, there's a solution' *(belief in the power of problem-solving approaches)*
2) 'We can understand something by breaking it down into its component parts' *(believing a complex whole can be understood by looking at the detail)*

3) 'The whole (of something) is no more than the sum of its parts' *(there are no emergent properties)*
4) 'Most processes are linear and characterised by cause and effect' *(events and phenomena have a identifiable beginning and finishing point)*
5) 'Most issues and events are fundamentally discrete or may be regarded as such, and may be dealt with adequately in a segregated way'*(most issues are essentially unrelated)*
6) 'It is ethically acceptable to draw your circle of attention or concern quite tightly, as in "that's not my concern"' *(our system of concern is restricted - we do not need to look beyond our immediate concerns as an individual, a householder, a consumer, a businessman etc.)*
7) 'Objectivity is both possible and necessary to understand issues' *(it is important to exclude our feelings and values in our analysis and judgment)*
8) 'We can define or value something by distinguishing it from what it is not, or from its opposite' *(a belief that economics is separate from ecology, people are separate from nature*, *facts are separate from values, etc – putting boundaries around that which we value)*
9) 'We can understand things best through a rational response. Any other approach is irrational' *(we need to downplay our intuition and non-rational knowing)*
10) 'If we know what the state of something is now, we can usually predict future outcomes' *(a belief in certainty, prediction, and the possibility of control)*

These ten assumptions can be re-stated as basic habits of thought or tendencies which characterise or exemplify the paradigm of modernist thinking as follows (in the same order as above):

1) problem-solving
2) analysis
3) reductionism
4) cause-effect
5) atomism
6) narrow boundaries
7) objectivism
8) dualism
9) rationalism
10) determinism

This kind of approach to issues has been phenomenally successful in the past, but arguably, is now maladaptive to contemporary conditions of increasing complexity, uncertainty and volatility in intermeshed economic, social and ecological systems. Whilst they still have validity and applicability to simple and contained problems, they are unsuited to the 'messy' and 'wicked' problems that often characterize sustainability issues (see *Coping with Complexity*, this volume). Try applying these approaches for example, to issues of climate change or loss of biodiversity, or poverty, and their inadequacy becomes apparent. As Klein (2004, 4) states:

> Arising from environments characterized by turbulence and uncertainty, complex problems are typically value-laden, open-ended, multidimensional, ambiguous, and unstable. Labeled 'wicked' and 'messy', they resist being tamed, bounded or managed by classical problem-solving approaches.

Such conditions require a different set of approaches and skills, which can be presented as follows. Each of the points is a corresponding rejoinder to the list of 'thinking assumptions' above (Sterling 2005).

1) Some solutions just produce more problems. Instead, we need to develop 'solutions that generate further solutions' (these are sometimes called 'positive synergies').
2) We often need to look at the whole, and at the larger context.
3) Complex systems show emergent properties; i.e., additional qualities that emerge from the interaction of the parts e.g., health in a human body.
4) We need to attempt to look at all the influences at the 'start', all the knock-on effects at the 'finish' and any feedback loops. This complexity is characteristic of most human and environmental systems.
5) Most issues/events are related to other issues/events and can be better understood in the light of this interrelated reality.
6) Complexity means that we need to expand our view of the world and be more aware of the boundaries of concern we set ourselves.
7) So-called opposites are in relationship. We tend to devalue one side against the other (ecology against economics, nature against people, values against facts etc), and instead, need to see them in relationship rather than in opposition.
8) The decision to try to be objective is a value judgment. Total objectivity is impossible. Better to recognise how our subjective self is involved in perception and interpretation of the world.
9) Intellect needs to be balanced with intuition, and rationality with non-rational ways of knowing; spiritual and aesthetic knowing (balancing our left brain with our right brain).
10) In human and most natural systems (that is, those systems which are not mechanical) it is impossible to predict outcomes. We need to be more flexible, accept uncertainty, and not try to control everything but participate in and learn from change.

The two sets of thinking approaches and assumptions can be summarized and compared as follows:

Two ways of thinking...

➢ Problem Solving	➢ Appreciation / reframing
➢ Analysis	➢ Synthesis
➢ Reductionism	➢ Holism
➢ Closed cause-effect	➢ Multiple influences through time and space

➢ Atomistic/segregative	➢ Integrative
➢ Narrow boundaries	➢ Extension of boundaries
➢ Objectivism	➢ Critical subjectivity
➢ Dualism	➢ Pluralism / duality
➢ Rationalism	➢ Rational / non-rational ways of knowing
➢ Determinism	➢ Uncertainty, tolerance of ambiguity

It is not a matter of abandoning the left hand side, even if this were possible. It is a matter of 'stepping out' of this paradigm, and recognising it - so that we master it, rather than it mastering us. In this way, we can employ these approaches but only when they are appropriate to the situation. Beyond this, developing an ecological sensibility, an understanding of interconnectivity, and an ability to design and act integratively requires attention to the more systemic set of approaches represented by the right hand side of the diagram. In terms of educational practices, it means curriculum designers and teachers developing learning situations where the potential for transformative learning experiences is made manifest. Such situations will reflect implicitly in their design, and/or explicitly in their pedagogic approaches, such questions as the following:

- *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 already works well here?
- *inclusive:* who/what 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?

Such learning will, ideally, be reflexive, experiential, inquiring, experimental, participative, iterative, real-world and action oriented, invoking 'learning as change' in the active pursuit of sustainability and in designing and developing sustainable systems - rather than merely 'learning about change' or 'learning for change' which may be seen as rather more passive steps on the way to a deeper learning response (see *Institutional Transformation*, this volume).

The Future Leaders Survey (2008), which surveyed some 25 000 young people, makes it clear that they are 'intensely aware of the big challenges facing the planet', but also notes that they are also the last generation with a chance to put things on a more sustainable course. The only way to maximise this chance, is through the rapid flowering of ecological intelligence, a *collective connective consciousness* and *competence* that all of us, educators, learners and graduates alike, share in.

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