

# Global Education: Towards a Quantum Model of Environmental Education

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## Abstract

In this paper I overview different interpretations of global education before proceeding to explore the “quantum worldview” that has profoundly influenced global education of the transformative variety. Quantum research has overturned the 17<sup>th</sup> century mechanistic paradigm of “world as machine” within which phenomena are to be understood by reducing them to their parts. Instead, a world of radical interconnectedness is revealed—of parts and wholes deeply embedded within each other and in dynamic and unfolding relationship. I present a four-dimensional model of transformative global education inspired by the “quantum worldview.” Some of the principal benefits of applying such a quantum model of education to environmental education, a field where the mechanistic paradigm still has some hold, are then elaborated.

## Résumé

Dans ce document, je survole différentes interprétations de l'éducation planétaire avant d'explorer la “vision du monde quantique” qui a profondément influencé l'éducation planétaire, notamment dans une perspective transformative. La recherche quantique a renversé le paradigme mécaniste du 17<sup>e</sup> siècle, “le monde est une machine”, selon lequel il faut saisir les phénomènes en les réduisant à leurs parties. Au contraire, un monde d'une radicale interdépendance se manifeste—des parties et des tous profondément liés les uns aux autres dans une relation dynamique et épanouie. Je présente un modèle quadridimensionnel de l'éducation planétaire transformative inspiré par une “vision quantique”. J'approfondis ensuite quelques-uns des principaux avantages d'appliquer un tel modèle quantique à l'éducation relative à l'environnement, domaine où le paradigme mécaniste exerce toujours une influence.

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## Varieties of Global Education

Towards the close of the first Regional Conference on Global Education organised by UNICEF MENA (Middle East and North Africa) and held at Broumana, Lebanon, in July 1995, I was asked, as conference consultant, to prepare at short notice a transparency conveying the essence of global education. For better or worse, I presented delegates with the following:

Global education is an holistic paradigm of education predicated upon the interconnectedness of communities, lands and peoples, the interrelatedness of all social, cultural and natural phenomena, the interpenetrative nature of past, present and future, and the complementary nature of the cognitive, affective, physical and spiritual dimensions of the human being. It addresses issues of development, equity, peace, social and environmental justice, and environmental sustainability. Its scope encompasses the personal, the local, the national and the planetary. Congruent with its precepts and principles, its pedagogy is experiential, interactive, children-centred, democratic, convivial, participatory, and change-oriented.

It needs to be made clear at the outset that there are multiple interpretations and many varieties of global education and that the term has experienced the same kind of “semantic inflation” which Lucie Sauv e, earlier in this volume, identifies with regard to sustainable development. For some, global education is akin to a world affairs option in a high school curriculum, offering an all-too-rare timetable slot for students to consider global issues and international relations in a systemic way (Heater, 1980). For others, it is a project to infuse the social studies curriculum particularly, but not exclusively, at intermediate and senior grades with a “global perspective” (Petrie, 1992; Werner & Case, 1997). Significantly, the national vehicle for the promotion of global education in the U.S.A. is the National Council for the Social Sciences. For yet others, global education seeks to promote the study of global issues and themes, such as sustainable futures, quality of life, conflict and security, and social justice, across the curriculum within an integrated, interdisciplinary or transdisciplinary framework (Lyons, 1992). Implicitly, or in some cases explicitly, however, the “buck” stops at the curriculum (and its associated learning and teaching methodologies). A further school of thought, in which I include myself, argues that global education is nothing less than the educational expression of an ecological, holistic or systemic paradigm (Capra, 1996; Capra & Steindl-Rast, 1992) and, as such, has implications for the nature, purposes and processes of learning and for every aspect of the functioning of a school or other learning community (Greig, Pike & Selby, 1989; Pike & Selby, in press).

If, within the fabric of the global education debate, differences regarding scope provide the warp of the argument, the weft concerns ideology, goals and purposes. There are those who perceive purpose in terms of increasing competitiveness, reinforcing dominance and buttressing decline within the global marketplace. The Illinois State Board of Education document, *Increasing International and Intercultural Competence through Social Sciences*, for instance, speaks of the need to equip students for effective participation in a world in which it is necessary to “court foreign investors and markets for locally produced goods” and Toh Swee-Hin (1993) has noted a similar commercial strategic argument in some Canadian educational mission statements. Knowing about global interdependencies, (some) global issues and other cultures will thus increase “global competitiveness.” Such a position is, perhaps, the baldest manifestation of the “liberal-technocratic” paradigm of global education within which global interdependencies are viewed uncritically (i.e. as symmetrical), culture is treated fragmentally and superficially rather than holistically and paradigmatically, and a management interpretation of the “global village,” with its reliance on experts and elites, is overtly or covertly embraced (Toh, 1993). Set against this is a “transformative paradigm” of global education which is “explicitly ethical,” encourages a critical global literacy (interdependencies at all levels viewed as preponderantly asymmetrical), highlights the “pervasive reality of structural violence,” embraces a radical pedagogy, and is liberationist, empowering and ecological (Toh, 1993, p. 11-14). Another divide of significance that has recently opened up within the field is between those whose work is (often uncritically) humanistic in tone and assumptions, and those calling for biocentric expressions of global education in which the human project is decentered (Pike, 1996; Selby, 1995).

In its transformative, holistic and biocentric modes, global education is sister to two significant “global proposals” not listed by Lucie Sauvé in her paper in this volume: holistic education and transformative learning. A central thrust of holistic education is “an awakening to the interconnectedness of all life”; the interrelationships existing between reason and intuition, mind and body, different domains of knowledge, self and community, self and earth, (ego-bounded) self and (oceanic) Self (Miller, 1993, p. 4-16, 1988). Transformative learning, inspired by the writings of Thomas Berry (1988; Swimme & Berry, 1992), calls for education that will assist and foment the transition from the present “terminal cenozoic” (industrial, consumer, market-driven) phase of earth history to an “ecozoic” phase, one where the well-being of the entire earth community is the primary project. Its curriculum and pedagogy offers a new cosmology, a widened and permeable

sense of self, and a radically different orientation to quality of life issues (O'Sullivan, 1999).

The global education I want to discuss in this paper is of the biocentric, holistic, transformative genre.

### **Global Education as Expressive of Quantum Reality**

Global education (in its holistic expression) has been profoundly influenced by quantum physics and by the "quantum worldview" proposed by some leading-edge physicists such as David Bohm (1983), Fritjof Capra (1982) and Danah Zohar (1990). Their argument is that insights drawn from the sub-atomic world provide a powerful model for our thinking about self, society and the planet. Much of their study and discourse turns around whether those insights are metaphorical (i.e. they offer persuasive analogies for reality at the macro level) or actual (i.e. that there exists an actual connection and direct correspondence between sub-atomic processes and the physics of human consciousness, potential forms of societal relationships and structures, and, for most of us, rediscovered ways of relating to the Earth).

What are those insights? First, quantum research has overturned the mechanistic/reductionist way of seeing the world that holds that phenomena can be understood by identifying and understanding the properties of their parts. Instead a world is revealed in which we can move towards an understanding of parts only by taking into account the dynamics of the whole. Paul Teller (1986) coins the term "relational holism" to convey how particles, their non-relational properties notwithstanding, can have no coherent identity or meaning save in relationship to everything else. In a very real sense, there are no parts but merely "patterns in an inseparable web of relationships" (Capra & Steindl-Rast, 1992, p. 83). Enfolded into the part is the signature of the whole. Quantum physicists have also long known that sub-atomic entities manifest themselves as both particles and waves—the so-called wave/particle duality. A full description of any entity calls for a full description of both its wave and particle states and their complementarity, and yet we cannot design an experiment enabling us to see both aspects of the duality at one and the same time (the uncertainty principle). We identify and measure waves or particles. "Nothing," writes Danah Zohar (1990), "is fixed or fully measurable, everything remains indeterminate, somewhat ghostly, and just beyond our grasp" (p. 11). When two quantum systems meet their particle aspect stays somewhat separate but their wave aspects overlap and merge giving rise to a new

quantum system (with its own particle and wave aspects). The two systems “get inside each other” and co-evolve (Zohar, 1994, p. 54). The uncertainty principle, it should be added, inevitably breaks down the mechanistic gulf between observer and observed, subject and object. What we see is ourselves in terms of our experimental/research decisions and prioritizations; our aspiration cannot realistically be detached objectivity but rather a dynamic intersubjectivity.

Context is, thus, crucial. A sub-atomic phenomenon is in “constant creative dialogue with its environment” (Zohar, 1994, p. 43). The researcher, who in her intervention becomes an aspect of context, evokes one face of reality’s rich potential while the whole remains elusive.

“Quantum leaps” occur when electrons suddenly and without apparent reason move into higher or lower energy orbits. Before a “leap” occurs (a “real” transition), an electron, as it were, smears itself everywhere simultaneously exploring all possible directions and journeys (“virtual” transitions). Quantum reality as a sea of potential that is both indeterminate and nonlocal offers a profound conceptual challenge to commonly understood notions of relationship. As Donah Zohar writes:

Both the concept of being as an indeterminate wave/particle dualism and a concept of movement which rests on virtual transitions presage a revolution in our perception of how things relate. Things and events conceived of as separate, parted in both time and space, are seen by quantum theorists as so integrally linked that their bond mocks the reality of both space and time. . . . If all potential ‘things’ stretch out infinitely in all directions, how does one speak of distance between them, or conceive of any separateness? All things and all moments touch each other at every point: the oneness of the overall system is paramount. (1990, p. 17-18)

The radical interconnectedness of the quantum world carries potentially far-reaching implications at the level of our human-in-world reality. If self arises in large part out of the sum total of our ongoing dynamic relationships, if we are intimately embedded in a reality greater than ourselves, if all phenomena, including ourselves, are non-localized, at least in our potential, then we move to a sense and experience of belonging, of being “at home,” with all lifeforms and all places; what David Steindl-Rast has called “that mystic sense of limitless belonging” (Capra & Steindl-Rast, 1992, p. 15 & 57). We recognize, too, that we have both particle and wave aspects, the former giving us form, (permeable) boundaries and (some of) our identity, the latter giving us “unstructured potential” with a “spreading out across the boundaries of space, time, choice and identity” (Zohar, 1994, p. 111). The complementarity of the two is demonstrated within our need for a healthy interplay between assertiveness and integration and within the

paradox that with deeper connectedness comes deeper individuality: “the more you know a friend, the more you know that friend as unknowable” (Capra & Steindl-Rast, 1992, p. 102). We also recognise that within a web of radical interconnectedness nothing is more fundamental than anything else, that within the web’s dynamic complexity nothing is completely knowable and that concepts, theories and frameworks are, at best, provisional approximations, that the mechanistic paradigm has given “confusion” (fusing with) a bad name and that it should be embraced in all its creative potential (Capra & Steindl-Rast, 1992, p. xiv-xv, 133-134).

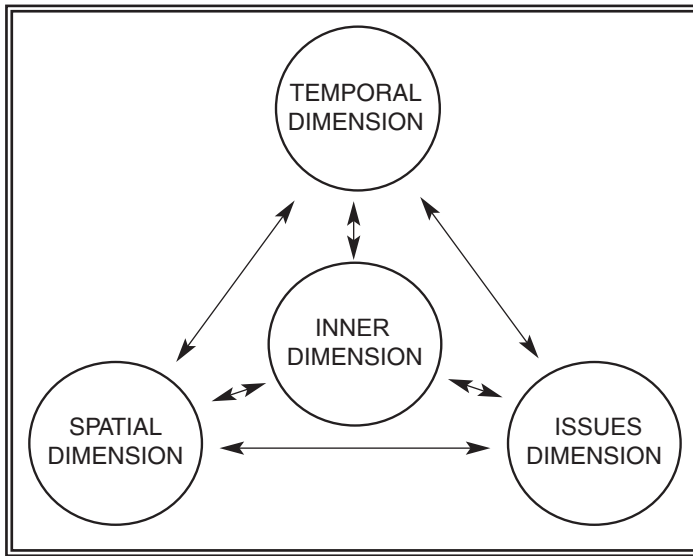


Figure 1. A four-dimensional model for global education.

A four-dimensional model (see Figure 1) drawing upon the quantum worldview has been proposed for global education (Pike & Selby, 1995, p. 4-21, 1988, p. 1-33). The spatial dimension addresses the concepts of interdependence and interconnectedness at multiple levels including intrapersonal, interpersonal, local, bioregional, national, international and global. The levels are not mechanistically conceived as concentric circles with, say, local and global at opposite ends of the spectrum, but as an “unbroken wholeness” (Bohm, 1983), mutually embedded and in dynamic relationship. The global, girdling the Earth, is, by definition, manifest within the local; the local flows into the global. An event at any level reverberates through, and can significantly affect all other levels, feeding back through the whole

to further transform the level and point of origin. This dimension also concerns the cycles and systems of nature and the relationships between human society and the environment, its underpinning philosophy overriding the dichotomies spawned by mechanism/reductionism (local/global, human/animal, human/environment, nature/culture, masculine/feminine, mind/body, content/process). In curricular terms it calls for forms of integration, interdisciplinarity or other-than-disciplinary and speaks to forms of learning that enable learners to cultivate an holistic mindset and attendant skills usually marginalised within the citadels of mechanism we recognize as schools. Intuition, for instance, the ability to immediately perceive and be sensitive to the whole (Capra & Steindl-Rast, 1992, p. 76), is recognised as a quality to be honed within the process of learning.

The issues dimension has three aspects. First, it calls for learners to learn about key global issues and themes each of which will have multi-levelled, including personal and local, manifestations. Hence, learners, at age-appropriate levels of sophistication, consider development, environmental, gender, health, needs/rights, peace, sustainability and other issues through and across the grades of schooling. Second, learners are encouraged to consider diverse perspectives (approximations) on these issues and themes from a variety of cultural, disciplinary, social, ideological, and paradigmatic vantage points. Third, the issues and themes are conceived of as enfolded in each other. A seemingly “environmental” issue is likely to contain within it aspects pertaining to all other themes and issues. As a passage in *The Avatamsaka Sutra* puts it: “In the heaven of Indra, there is said to be a network of pearls so arranged that if you look at one you see all the others reflected in it. In the same way each object in the world is not merely itself but involves every other object, and in fact IS everything else” (cited in Pike & Selby, 1995, p. 13). Issues are presented in non-causal, non-linear frameworks demanding a reconceptualization of the nature of both “problems” and “solutions.” “Problems” are manifestations of interwoven and multi-layered webs of relationships; “solutions” are at best provisional adjustments within an ongoing, dynamic process.

The temporal dimension concerns the interpenetrative nature of what are commonly perceived as distinct phases of time. Past, present and future are embedded, one within another. Future is a “zone of potentiality” (Pike & Selby, 1995, p. 16) or potentiality as a plethora of “virtual” transitions spread across present reality (Zohar, 1994, p. 50) or that which unfolds from within the implicate order of reality (Weber, 1986, p. 23-29). The dimension calls for learners to reflect upon alternative futures: the vast range of futures, at all levels, intrapersonal through global, that are



“virtual” at any moment. Alternative futures are typically divided up into probable futures, which are likely to happen if present trends continue, possible futures, futures that might conceivably come about or whose virtuality with nurture could be real-ized, and preferred futures, futures that, given our values, we would like to have come about. Through envisioning such alternatives, through heightened responsiveness to the latent potential of situations, through intellectual and sensorial engagement in the present, and through developing our capacity and skills for change agency, we can become transforming learners.

The dimensions of the model reflect what novelist Penelope Lively has called “the cosmic chaos of everywhere, all time”; an interpenetrative reality in which all “places,” “events” and “moments” touch. The inner dimension of the model draws upon the quantum insight that our self world is a co-evolving world; it shifts in consequence of the sum total of our ongoing interactions and exchanges with the wider world. In learning terms we can speak of outward and inward learning journeys. As we journey outwards to learn of the world, we also engage in a journey into self. Person<>Planet (Roszak, 1978). Inscape<>Landscape. The two journeys are complementary, reciprocal and mutually resonating. This is nothing more or less than education for authentic personhood. “A person,” says David Steindl-Rast, “is defined by relationship to other, to other persons and to other beings in general. We are born as individuals, but our task is to become persons, by deeper and more intricate, more highly developed relationships. There is no limit to becoming more truly personal. So the challenge to our freedom would be to personalize the universe” (Capra & Steindl-Rast, 1992, p. 95).

### **A Global Environmental Education**

What might be some of the benefits of applying such a quantum model of education to environmental education? Six suggestions will be advanced. First, that the dynamic notion of space it embraces offers a constructive and inclusive approach to arguments surrounding place and scale. Second, that the issues dimension offers a means whereby environmental education can more comprehensively and sustainedly explore the interface between environmental themes and issues and other contemporary themes and issues. Such a process would additionally help to de-emphasise science within environmental education and provide for a fuller embrace of interdisciplinarity by proponents of the field. Third, that the temporal dimension offers a richer, less technocratic and more congruent approach to



considering the future than education for sustainable development, education for sustainability and education for sustainable futures. Fourth, that the inner dimension affirms inscape as a significant dimension within environmental education. Fifth, that global education pedagogical theory may be a useful addition to environmental education discourse. Sixth, that an approach that recognizes the “family likeness” between a range of progressive educations offers, conceptually and strategically, a sounder approach to effecting whole-school or cross-institutional change.

## 1.

Madhu Suri Prakash (1994), following Wendell Berry, writes of the “dangerous arrogance of those who profess to be thinking globally, but also of the human impossibility of this form of thought” (p. 51). Given its complexity, she argues, nobody can “know” the globe save by statistical reduction. Additionally, global proposals are “necessarily parochial” in that they inevitably express the vision of specific, usually powerful, interest groups (p. 55). She proposes that communities delink “with ingenuity and effectiveness” from “global thinking” and from “plans and proposals that marginalize them from the operations of the global economy” (p. 55). In what is a passionately argued piece, it is unfortunate that Prakash presents caricatures of “thinking” (which she depicts as knowing facts), of “alternative globalists” (whom she depicts as do-gooders, as deracinated as the global powerful), and global (and related) educations (which she contrasts adversely with unspecified educational options drawing upon “the humility and radical pluralism of local thinking”) (p. 55). There are underlying mechanistic assumptions to Prakash’s challenge to “global thinking” that merit comment. First, she posits “local” and “global” as dichotomies when they are embedded within each other. Second, the notion of delinked communities overlooks the interrelatedness of phenomena and places; we always live downstream of somebody and need to know about, so as to be able to counteract, actual or potential negative impacts. Third, we need to know the whole, in the sense of understanding significant developments and trends, if we are to defend our communities against deleterious external forces, which, under a quantum understanding, are also internal forces.

This is the nub of my first point. Within the altogether commendable shift towards representing environment as place and, in education, towards place-based environmental education (Traina & Darley Hill, 1995; Orr, 1992, p. 125-131), there is the ever implicit danger of an either/or mentality

which in embracing localism or bioregionalism chooses to ignore the global. A quantum environmental education calls for a both/and approach. In arguing the merits of a pedagogy of place, David Orr recognizes that place-oriented environmental education could become “inherently parochial and narrowing” and suggests “the study of relationships between places as well” (p. 131). Following Mumford, he sees place as the most immediate of a series of spatial layers. This is a dangerously mechanistic conception of space. The global is immediately manifest in the local just as the whole is immediately manifest in the part .

## 2.

The issues dimension of the model calls upon environmental educators to consider whether they have sufficiently explored the interface of their field with other progressive “educations.” While there has been dialogue between development and environmental educators since the Brundtland Report (WCED, 1988) and, more intensively, since the Rio Earth Summit of 1992, resulting in the education for sustainable development, sustainability, and sustainable futures initiatives, it is questionable how far and how deep the dialogue has gone in other directions. Peace educators, for example, have long identified “environmental damage” as a problem of peace and “ecological balance” as one of the values underlying peace (Hicks, 1988; Smith & Carson, 1998) but the concepts, models and theories of peace education have found little place within the discourse of environmental educators. Likewise, dialogue between environmental educators and humane educators, whose spheres of interest include animal-related issues, challenging anthropocentrism, and the correlation of human and nonhuman oppressions, is minimal (Selby, 1995; Bell & Russell, in press). Mainstream environmental education has also been blinkered in its consideration of the interface between environment and class, race/ethnicity and gender in terms of the causes and impacts of environmental damage. “Environmental problems,” writes Cheryl Lousley (1998), “can be read as social justice issues where class, race/ethnicity, and gender are significant factors in determining who experiences the effects of, and who controls the causes of, environmental degradation”(p. 27). A quantum environmental education would embrace environmental justice concerns (Bryant, 1995; Warren, 1996) just as it would follow through on environmentalism’s espousal of diversity by recognizing the multiple cultural perspectives (approximations) on environment and environmental education within today’s pluralistic societies (Running Grass, 1996) The rich literature on ecofeminism

notwithstanding, there also remains a real need to fill out our understanding of the nature, scope, goals, and processes of ecofeminist environmental education (Russell & Bell, 1996). Similarly, we might bemoan the present trickle of dialogue, the thin lines of connectivity, between environmental educators and health, human rights, citizenship and media educators. In short, proponents of each “education” need to recognize that their respective fields of interest are mutually enfolded, that each is a pattern or manifestation within an inseparable web, and that through open and full dialogue comes enrichment and, of course, challenge and transformation. John Huckle’s call in this volume for education for sustainability and cosmopolitan democracy is much more likely to be realized within such recognition. An environmental education colluding with mechanism by building or maintaining walls around itself is, in the final analysis, neither congruent with ecological principles nor sustainable.

If environmental educators come to conceive of their field as one among a “network of pearls,” there will be a greater likelihood of it casting off its abiding image (and, in Canada, actuality) as a sub-division of science (Russell, Bell, & Fawcett, in press). The science-humanities segregation in curriculum at all levels reflects the nature-human divide spawned by mechanistic science. Science alone, or primarily, cannot deliver a transformative education predicated upon eco-responsiveness, democracy, equity, notions of global and plural citizenship, and sustainability. Neither can it offer sufficient insight: only approximate understandings built upon assumptions that may in time be overturned, understandings that blur at the edge or are found in some respects wanting as they become contiguous or overlap with understandings arising from within other domains of knowledge. The uncertainty principle writ large. An educational response to the present confluence of environmental and social crises calls for vigorous interdisciplinarity, a confluence and interplay of approximations from different disciplines, among which none enjoys hegemony.

### 3.

Education for sustainable development, education for sustainability and education for sustainable futures are all future-oriented. Each is imbued with notions of intergenerational accountability and intergenerational justice, of avoiding “compromising the ability of future generations to meet their own needs” (WCED, 1988). There are a number of concerns, however. First, by earmarking a particular conception of the future as the desired outcome of our educational endeavour, are we not constricting the future as a

“zone of potential,” causing “virtual transitions” with all their inherent possibility to prematurely collapse? Or, put another way, are we falling for the mechanistic fundamentalist fallacy, i.e. that certain phenomena are more primary or fundamental than others? Preferable would be an educational project that allows for a constellation or network of values to inform its purpose. The temporal dimension of the model discussed here, with its triad of probable, possible and preferred futures, is of that kind and, by encouraging an interplay between the three strands (Figure 2), allows for understanding of the merits and demerits of the fullest range of options, and for informed choice through a process of critical reflection and values clarification. A catholically-conceived temporal dimension also allows for the different conceptions of time and change across a range of cultures to be studied and considered.

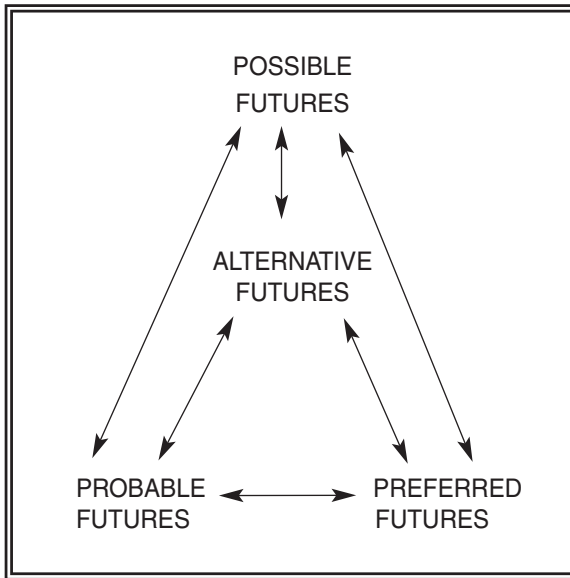


Figure 2. The temporal dimension of global education.

4.

A guiding principle of the quantum worldview is that personhood or mature individuality, literally “undividedness,” arises out of a dialectic between self and whole. A person who fails to connect with the whole (perhaps more correctly described as a “dividual”) must necessarily distort his or her own nature. The individual in turn contributes to the dynamic evo-

lution of the whole. As Theodore Roszak (1978) so eloquently puts it: "My argument is that the needs of the planet are the needs of the person. And, therefore, the rights of the person are the rights of the planet . . . . The adventure of self discovery stands before us as the most practical of pleasures" (p. 26). The point here is a straightforward one. A review of environmental education literature and learning/teaching materials suggests a prevailing outer-directedness (individuals looking out on the world) and insufficient emphasis upon "inner ecology" (Greig, Pike & Selby, 1987, p. 43) or inscape. Neither Sauv  s or Huckle's search for an integrating educational framework that would contribute to the resolution of the myriad environmental and social problems we face gives space to a complementary inner journeying. Yet, as Roszak has more recently pointed out, there is likely no way back to planetary and societal health unless we heal the dichotomy between psyche and nature born of industrialism and 17<sup>th</sup> century mechanistic science (1992, p. 45 & 63).

The great changes our runaway industrial civilization must make if we are to keep the planet healthy will not come about by the force of reason alone or the influence of fact. Rather, they will come by way of psychological transformation. What the Earth requires will have to make itself felt within us as if it were our own most private desire. Facts and figures, reason and logic can show us the errors of our present ways; they can delineate the risks we run. But they cannot motivate, they cannot teach a better way to live, a better way to want to live. That must be born from inside our own convictions. And that birth may have to be a painful one. (p. 47)

An inner dimension is a *sine qua non* of a quantum or ecological worldview yet it is, for the most part, undervalued or absent within environmental education.

## 5.

Lucie Sauv  , writing earlier in this volume, is correct in her assertion that education for sustainable development, sustainability, and sustainable futures attribute, as of their own devising pedagogical characteristics common across progressive movements in education. Her caution can, likewise, be applied to a number of other new "educations." We can, however, in one sense make forms of pedagogy distinctively our own by furnishing a rationale for their use that arises directly out of and is congruent with the educational paradigm we embrace. This is in contradistinction to their instrumental use, that is because they seem effective in realising our

immediate goals (p. 49-60). It has been a significant area of endeavour within global education to develop a pedagogical theory and approach rooted in quantum/ecological principles such as interdependence, interaction, dynamic multi-directional energy flows, diversity, flexibility and co-evolution (see, for instance, Selby, 1996a, p. 49-60). A quantum model of environmental education in all its dynamism would likely induce heightened sensitivity to and appreciation of the importance of processive aspects of our enterprise.

## 6.

My final suggestion is that a global education approach, as summarised in the quotation with which this paper began and embracing a kaleidoscopic concept of space and time, an alliance of "educations," inner ecology and a distinctively formulated learning rationale (and associated good practice), has both conceptual coherence and real strategic potential in our efforts to transform learning institutions. The Ontario Green Schools Project (1993-6) adopted such an broad-based approach in its endeavour to green seven schools. Out of dialogue between project co-ordinators and teachers, non-teaching staff, students, parents and community members in seven Ontario schools over the three years of the Project, emerged eight school ethos principles:

- The school fosters learning and social environments that promote equity, fairness, peace, and social and environmental justice.
- The school commits to principles and processes of participatory democracy.
- The school wholeheartedly embraces an ethic of environmental responsiveness.
- The school values diversity while affirming commonality.
- The school commits to educating for a fast-changing, interdependent world.
- The school fosters the inherent worth and dignity of each individual, positive interpersonal relationships, and safe school environments.
- The school promotes healthy lifestyles and relationships.
- The school values congruence between its principles and its practices (Selby, 1996b, p. 41-45).

The manifestations of each principle and the nature of school change processes directed towards their realization will be the subject of a forthcoming book (Pike & Selby, in press).

It is fair to say that, while such an holistic working conception brought its own myriad problems, anything short of a global rendition of environmental education would have carried less resonance and encountered less acceptance amongst the multiple interests that comprise any learning institution.

### Notes

This paper is not urging that environmental education embrace the term global education but rather that its proponents look seriously at the educational implications of quantum reality, which have informed global education in its more holistic expressions. A thought-provoking way to conceive of what is being proposed is to think of a hologram. The exciting thing about a hologram is that each part of a holographic image contains information spread across the whole pattern. The part, thus, contains the code of the whole. Hence, if we break a hologram apart we will still be able to recreate the whole from each of the pieces. "Each individual part of the picture contains the whole of the picture in condensed form. The part is in the whole and the whole in each part—a type of unity-in-diversity and diversity-in-unity. The key point is simply that the part has access to the whole" (Wilber, 1982, p. 2). The relationship that is proposed here between environmental and global education is holographic; the fields potentially carry the code of the whole—they can be conceived of as both part of the whole and simultaneously as the whole. A quantum worldview "requires that each of us, to some extent, let go of our fixed perceptions, our habits, our obsessions, our rigid ideologies, our parochial devotion to our own corner. It requires, instead, that we stand poised and alert, poised to let our inner freedom (our indeterminacy) give rise to the unfolding, common reality of self and community" (Zohar, 1994, p. 135).

### Notes on Contributor

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