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## The denaturation of environmental education: exploring the role of ecotechnologies

### Abstract:

*This article explores the changing ways 'environment' has been represented in the discourses of environmental education and education for sustainable development in United Nations (and related) publications since the 1970s. It draws on the writings of Jean-Luc Nancy and discusses the increasingly dominant view of the environment as a 'natural resource base for economic and social development' and how this instrumentalisation of nature is produced by discourses and 'ecotechnologies' that 'identify and define the natural realm in our relationship with it'. This denaturation of nature is reflected in the priorities for sustainable development discussed at Rio+20 and proposed successor UNESCO projects. The article argues for the need to reassert the intrinsic value of 'environment' in education discourses and is intended to be a wake-up call to the changing context of the 'environment' in education for sustainable development discourses. In particular we need to respond to the recent UNESCO direction of global citizenship education as the successor to the Decade (2013) that continues to reinforce an instrumentalist view of the environment as part of contributing to 'a more just, peaceful, tolerant, inclusive, secure and sustainable world'.*

### Context

In this article we explore the changing ways in which 'environment' has been conceptualised in the discourses of the environmental education and education for sustainable development movements in United Nations (and related) publications since the 1970s. The precursors of these movements are evident in the 1972 United Nations Conference on the Human Environment held in Stockholm and its Declaration which proclaims: 'to defend and improve the environment for present and future generations has become an imperative goal for mankind [sic]' (UNESCO, 1978, p. 24). Concerns about the quality of both 'natural' and human-made environments continued in the Belgrade Charter Framework for Environmental Education (UNESCO, 1975), which includes such statements as:

It is absolutely vital that the world's citizens insist upon measures that will support the kind of economic growth which will not have harmful repercussions on people – that will not in any way diminish their environment and their living conditions... 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 all 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... This new environmental education must be broad based and strongly related to the basic principles outlined in the United Nations Declaration on the New Economic Order (pp.1-2).

We interpret the Belgrade Charter's concerns for 'the improvement of the quality of the environment and of life for *all* the world's people' (our emphasis), as converging with Jean-Luc Nancy's (2007) concerns about how the world, via globalisation, has been transformed into a *glome* or *glomus*. Nancy (2007) emphasises that a world is 'a totality of meaning' (p. 41). That is, if we speak of 'Shakespeare's world', the 'world of academia' or the 'third world' we understand immediately that these expressions refer to a totality, to which 'a certain meaningful content or a certain value system properly belongs in the order of knowledge or thought as well as in that of affectivity and participation' (p. 41). Nancy (2007) continues:

Belonging to such a totality consists in sharing this content and this tonality in the sense of 'being familiar with it,' ...of apprehending its codes and texts, precisely when their reference points, signs, codes, and texts are neither explicit nor exposed as such. A world: one finds oneself in it [*s'y trouve*] and one is familiar with it [*s'y retrouve*]; one can be in it with 'everyone' [*tout le monde*'], as we say in French. A world is precisely that in which there is room for everyone, but a genuine place, one in which things can genuinely *take place* (in this world). Otherwise, this is not a 'world': it is a 'globe' or a 'glome' (p.42; italics in original).

The sense of *glome* to which Nancy (2007) refers is from the Latin 'glomus' (a ball), as in *agglomeration*: with its senses of *conglomeration*: 'a piling up, with the sense of accumulation that, on the one hand, simply concentrates ... the well-being that used to be urban or civil, while on the other hand, proliferates what bears the quite simple and unmerciful name of misery' (p.33). According to Nancy (2007), this 'agglomeration invades and erodes what used to be thought of *globe* which is nothing more now than its double, *glomus*' (pp.33-34):

In such a *glomus* we see the conjunction of an indefinite growth of techno-science, of a correlative exponential growth of populations, of a worsening of inequalities of all sorts within these populations – economic, biological, and cultural – and of a dissipation of the certainties, images, and identities of what the world was with its parts and humanity with its characteristics (Nancy, 2007, p. 34).

In Marc De Kesel's (n.d.) view, Nancy is arguing that 'globalization not only has modified the world, it has... changed the way we relate to the world... We can no longer consider ourselves as standing outside the world' (p. 1). Our decision to use Nancy's concepts in framing our analysis of environmental education discourses stems in part from our perception of their generativity for 'resisting becoming a *glomus* body' in theorising our embodied participation in educational research (see Annette Gough, 2015).

Nancy argues that, because our 'world' has become a 'globe', we need to make a decision to reinvent or (re)create the world by deciding to deconstruct the logic of the double bind in our present globalisation discourse. De Kesel (n.d.) interprets this process as a work in progress:

Our world is... the passage and the transition from the globe... to the 'world'... The 'mondialisation' will remain within the transition towards this beyond... The 'mondialisation' will force us to redefine our world as being this very transition. And to create such a world, we have to assume ourselves as being the Dasein of that transition. In the case of globalization, we have to be the place (Dasein) where the event of the transition from 'globe' to 'world' happens, occurs, takes place. We therefore have to assume our own being as transition (p.16).

The relationship between *glome* and *globe* provides an opportunity for Nancy to articulate the transition from *globe* to *globalisation* (and *monde* to *mondialisation*). We use the above and following outlines of Nancy's arguments for creating the world, *mondialisation*, as an alternative to globalisation, and his notion of *ecotechnologies* as a critique of globalisation, as a framework for analysing the international documents around the United Nations Decade of Education for Sustainable Development.

### Ecotechnologies and the 'end of nature'

The instrumentalisation of nature can be attributed to what Nancy (2007) calls *ecotechnology*:

it is clear that so-called 'natural life,' from its production to its conservation, its needs, and its representations, whether human, animal, vegetal, or viral, is henceforth inseparable from a set of conditions that are referred to as 'technological', and which constitute what must rather be named *ecotechnology* where any kind of 'nature' develops for us (and by us) (p. 94).

Following Nancy, Amanda Boetzkes (2010) argues that

there is no nature for us that is not thought through *ecotechnology*, be it a reductive biological model, the conservation paradigm, resource management, sustainability, global warming, hybrid cars, compact fluorescent light bulbs, and wind turbines to name only a few of the many discourses and accompanying techniques that identify and define the natural realm in our relationship to it (p. 29).

Thus, for Nancy (2000), ecotechnologies enframe the world and imply a triple division of the world: 'the division of the rich from the poor; the division of the integrated from the excluded; and the division of North from the South' (p.135); ecotechnology 'damages, weakens and upsets the functioning of all sovereignties,

except for those that in reality coincide with ecotechnical power' (pp.135-6). Moreover, 'what *forms a world* today is exactly the conjunction of an unlimited process of eco-technological enframing *and* of a vanishing of the possibilities of forms of life and/or of common ground' (Nancy, 2007, p.95, italics in original).

For Nancy, history (until this point) is precisely a history in relation to a nature that is simply given (both as the ground and telos of history) and the exhaustion of the world through globalisation signals retrospectively a historical process of rupture that Nancy (2007) terms *denaturation* (p.82) and leads him to view the 'first creation of the world' from the standpoint of *ecotechnology*. He subsequently argues that we should consider 'the possibility... of determining the history of technologies up to our time without giving it another meaning in its fundamental contingency than the indefinite relation of technology to itself and to the escape of its denaturation' (p.89). Nancy (2007) also argues that *ecotechnologies* produce a sense of nature by their very *denaturation* and that, 'It is in denaturation that that something like the representations of a "nature" can be produced' (p.87). In an analogous fashion to the sense in which biochemists deploy 'denaturation' (to refer to the loss of biological functions due to structural changes in macromolecules caused by extreme conditions, such as heating certain proteins to the point at which they form enzyme resistant linkages that inhibit the separation of constituent amino acids), Nancy (2011) asserts that the technological manipulation of the *logos* reveals the denaturation of history, of the human being, and of life:

not only is there no such thing as 'human nature', but 'humankind' (*l'homme*) is virtually incommensurable with anything you could call a 'nature' (an autonomous and self-finalised order), because the only characteristics it has are those of a subject without a 'nature' or one that far outstrips anything we could call 'natural' – in a certain sense (either pernicious or felicitous depending on one's point of view) the subject of a *denaturation* (p. 66; italics in original).

In modern industrial societies, nature has often been defined as Other to culture. For example, Shane Phelan (1993) observes that 'the opposition to "culture" provides the bedrock meaning of "nature" in the West, but this opposition has become fraught with tension' (p. 44). In a eulogy for what he calls 'the end of nature', Bill McKibben (1990) draws attention to the self-constitutive force of differentiating ourselves from nature's externality and otherness:

When I say that we have ended nature, I don't mean, obviously, that natural processes have ceased – there is still sunshine and still wind, still growth, still decay... *But we have ended the thing that has, at least in modern times, defined nature for us—its separation from human society* (p. 60, italics in original).

We have killed off nature – that world entirely independent of us which was here before we arrived and which encircled and supported our human society... In the place of the old nature rears up a new 'nature' of our making. It is like the old nature in that it makes its points through what we think of as natural processes (rain, wind, heat), but it offers none of the consolations—the retreat from the human world, the sense of permanence and even of eternity (p. 88).

The denaturation of what McKibben calls 'natural processes (rain, wind, heat)' is especially apparent in the ways many of us now experience weather. Although we may still attend to the ways in which we engage physically with the weather, we have also naturalised the technologies through which weather is presented to us as an abstraction: to interpret or forecast the weather we are more likely to look at a television screen or tap a weather app on a smart phone rather than go outside and look at the sky. Our cultural activities – industrial pollution, urbanisation, agribusiness – have quite literally 'constructed' the greenhouse effect and eroded the ozone layer but our knowledge of these and the many other complexities of climate change is constructed by a global network of weather stations, satellites, supercomputers, meteorologists and broadcasters which produces the images, models and simulations that constitute the material representations of that knowledge. In this sense, as Jody Berland (1994) writes, 'the weather can no longer be considered "natural"... but (like gender and other previously "natural" concepts) must be understood as [a] socially constructed artifact' (p. 106).

Much of what now counts as 'nature' for those of us who dwell in highly urbanised and technologised societies, consists of the measurement and projection of human culture's interactions with the biosphere (Noel Gough, 1997), in and on what, following Nancy, we can now call an ecotechnology of global information flows. Under these circumstances, we find it most helpful to think of environmental education as a struggle to come to pedagogic terms with the 'narrative complexity' (Noel Gough, 1993) generated by the categorical ambiguities and entanglements that now attend such concepts as self, culture, nature, and artefact. To date, little of what is performed in the name of environmental education has engaged (or sought to engage) this struggle but, rather, tends to reflect and to naturalise models of social interaction in which 'rational' behaviour is assumed to follow from human actors pursuing their more or less enlightened self-interests in maximising utilities and amenities or satisfying preferences. Environmental education typically depicts the forms of knowledge it privileges (whether this be abstract scientific knowledge or experiential fieldwork) as being instrumental in enabling humans to pursue such 'rational' choices but ignores the ways in which human agency is *produced* by and within the complex circuits and relays that connect – and contingently reinforce – knowledges and subjectivities in the technocultural milieux of postmodern societies. Yet the extent to which knowledges are authorised, and the manner in which they are (or are not) mobilised in the form of dispositions to act (or not), may be very

sensitive to different cultural traditions, values and identities. For example, Brian Wynne (1994) argues for caution in predicting the effects of providing people with scientific knowledge of global environmental change:

The assumption is that increasing public awareness of global warming scientific scenarios will increase their readiness to make sacrifices to achieve remedial goals. Yet an equally plausible suggestion is that the more that people are convinced that global warming poses a global threat, the more paralysed they may become as the scenarios take on the mythic role of a new 'end of the world' cultural narrative. Which way this turns out may depend on the tacit senses of agency which people have of themselves in society. The more global this context the less this may become. Thus the cultural and social models shaping and buried within our sciences, natural and social, need to be explicated and critically debated (p. 186).

Comparable arguments can be mounted in relation to efforts by socially critical environmental educators to increase public awareness of, say, the extent to which scientific models of climate change reflect the interests of developed countries and obscure the political domination, economic exploitation and social inequities underlying much global environmental change. Again, we cannot assume that such knowledges will mobilise people 'to make sacrifices to achieve remedial goals'. To do so would be to ignore the possibility of what Wynne (1994) calls 'the intrinsically alienating effects of knowledge which constructs people in environmental processes as if they are merely reproducing and extending consumer-based capitalism' (p. 187) – to which we could add imperialism, colonialism, racism, and so on.

Such considerations lead us to suggest that in environmental education we need to attend much more closely to the micro-politics of subjective life, though not, we must emphasise, as a further exercise in the kind of scrutiny and surveillance that we already practice to excess in education and educational research. Rather, we need to participate more fully, self-critically, and reflexively in the cultural narratives and processes within which identity, agency, knowledges and ecotechnologies are discursively produced. Put bluntly, environmental education should be less concerned with 'nature' than with its *denatured* cultural invention.

### Denaturation in Environmental Education Discourses

Numerous reports over the past two decades and more from international and national government bodies (see, for example, Garnaut, 2008; State of the Environment 2011 Committee, 2011; United Nations, 1993, 2002, 2012; World Commission on Environment and Development, 1987) agree on the need for an holistic approach towards sustainable development, which the World Commission on Environment and Development (1987) characterises as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (p.8). Such sustainable development encompasses the



interconnectedness of social, economic and environmental issues, rather than focusing primarily on environmental protection.

These reports also acknowledge the importance of education at all levels in achieving a sustainable future:

Education is critical for promoting sustainable development and improving the capacity of the people to address environment and development issues... It is also critical for achieving environmental and ethical awareness, values and attitudes, skills and behaviour consistent with sustainable development, and for effective public participation in decision-making. (United Nations, 1993, paragraph 36.3)

In this instrumentalist view, education for sustainable development (ESD) is seen as the means by which schools and communities can (and should) work towards creating a sustainable future.

Perhaps the most important international meeting regarding environmental education was the Intergovernmental Conference on Environmental Education held in Tbilisi (USSR) in 1977 (UNESCO, 1978). The goals and objectives of environmental education recommended at this conference (UNESCO, 1978, pp.26-27) continued to be endorsed at subsequent UNESCO and UN meetings. For example, the report of the 1987 UNESCO Moscow International Congress on Environmental Education and Training states that the 'Recommendations of the Tbilisi Conference (1977) on environmental education goals, objectives and guiding principles are to be considered as providing the basic framework for environmental education at all levels, inside or outside the school system' (UNESCO-UNEP, 1988, p. 6). Similarly, the education chapter of *Agenda 21*, the strategy plan from UNCED, states that '[t]he Declaration and Recommendations of the Tbilisi Intergovernmental Conference on Environmental Education organized by UNESCO and UNEP and held in 1977, have provided the fundamental principles for the proposals in this document' (United Nations, 1993, para. 36.1). The goals from the Tbilisi conference (UNESCO, 1978, p.26) to which these documents refer are:

1. The goals of environmental education are:
  - (a) to foster clear awareness of, and concern about, economic, social, political and ecological interdependence in urban and rural areas;
  - (b) to provide every person with opportunities to acquire the knowledge, values, attitudes, commitment and skills needed to protect and improve the environment;
  - (c) to create new patterns of behaviour of individuals, groups and society as a whole towards the environment.



As with the Belgrade Charter statement noted above, the focus here is on the total environment and its improvement and protection as well as not having 'harmful repercussions on people'.

There was a transition in terminology between the Belgrade Charter (UNESCO, 1975), the Tbilisi Declaration (UNESCO, 1978) and later reports in that 'environmental education' increasingly was replaced by 'education for sustainable development' in both *Agenda 21*, the report of the 1992 Earth Summit held in Rio de Janeiro (United Nations, 1993) and the report of the 2002 United Nations World Summit on Sustainable Development held in Johannesburg (United Nations, 2002). This World Summit declared education as critical for promoting sustainable development. However, the vision from *Agenda 21* broadened from a focus on 'the role of education in pursuing the kind of development that would respect and nurture the natural environment' to encompass 'social justice and the fight against poverty as key principles of development that is sustainable' (UNESCO, 2004, p. 7), as is evident in this statement from the World Summit report:

We recognize that poverty eradication, changing consumption and production patterns and protecting and managing the natural resource base for economic and social development are overarching objectives of and essential requirements for sustainable development (United Nations, 2002, p.2).

This statement is significant because the environment is now represented as a 'natural resource base for economic and social development', and notions of improving the quality of the environment, contained in earlier statements, have disappeared. In Nancy's terms, the globe is becoming a *glome*, and we are caught in the transition.

Silences around the intrinsic value of the environment, and even biodiversity, continued into the outcomes report of the Rio+20 United Nations Conference on Sustainable Development (United Nations, 2012) where the thematic areas and cross-sectoral issues are summarised as:

- Poverty eradication
- Food security and nutrition and sustainable agriculture
- Energy
- Sustainable transport
- Sustainable cities
- Health and populations
- Promoting full and productive employment, decent work for all, and social protections.

That these are the priorities for sustainable development is consistent with Nancy's (2007) argument that *ecotechnologies* produce a sense of nature by their very 'denaturation' and that ecotechnologies imply a triple division of the world.

Following proposals from Japan and Sweden, and following the Johannesburg Plan of Implementation, the United Nations General Assembly, at its 57th Session in December 2002, adopted a resolution to start the Decade of Education for Sustainable Development (DESD) from January 2005. UNESCO was designated to be the lead agency for the Decade and it developed an International Implementation Scheme for the DESD (UNESCO, 2004, 2005).

The UNESCO Scheme brought together a range of international initiatives that were already in place – in particular the Millennium Development Goals (MDG) process, the Education for All (EFA) movement, and the United Nations Literacy Decade (UNLD) – with education for sustainable development (ESD).

All of these global initiatives aim to achieve an improvement in the quality of life, particularly for the most deprived and marginalised, fulfillment of human rights including gender equality, poverty reduction, democracy and active citizenship. If the MDGs provide a set of tangible and measurable development goals within which education is a significant input and indicator; if EFA focuses on ways of providing educational opportunities to everyone, and if the UNLD concentrates on promoting the key learning tool for all forms of structured learning, DESD is more concerned than the other three initiatives with the content and purpose of education. Conceiving and designing ESD challenges all forms of educational provision to adopt practices and approaches which foster the values of sustainable development (United Nations University, 2006).

Somewhere between the environmental education statements from Belgrade (UNESCO, 1975) and Tbilisi (UNESCO, 1978), the education for sustainable development statements from Johannesburg (United Nations, 2002), and the Decade (UNESCO, 2004, 2005), a concern for the environment disappeared and the whole focus became the human condition, or what Nancy (2007) calls *denaturation*: ‘“humanity” is the indexical name of the indefinite and infinite term of the human denaturation’ (p.87).

### Future directions?

During the Decade there have been two reviews (Arjen Wals, 2009; Arjen Wals & Cathy Nolan, 2012) of progress that recognise that ESD is being interpreted in many different ways in different contexts and that ESD has replaced environmental education in some instances in formal education. However, in the first review it is also noted that ‘many countries have a tradition in addressing the environmental dimension of sustainability and are quite comfortable in doing so, this is less the case when it comes to the social, economic and cultural dimensions’ (Wals, 2009, p.71). In the next review Wals and Nolan (2012) found that ‘ESD appears well positioned to play a synergizing role among a wide variety of sub-fields of education. These include environmental education, global citizenship education and, more recently, consumer education, climate change education and disaster risk reduction’ (p.65). This latter

statement is prescient in that UNESCO, as part of the UN Secretary-General's Global Education First Initiative that was launched in 2012, is already investigating global citizenship education as an emerging perspective that encompasses sustainability:

Education must be transformative and bring shared values to life. It must cultivate an active care for the world and for those with whom we share it. Education must also be relevant in answering the big questions of the day. Technological solutions, political regulation or financial instruments alone cannot achieve sustainable development. It requires transforming the way people think and act. Education must fully assume its central role in helping people to forge more just, peaceful, tolerant and inclusive societies. It must give people the understanding, skills and values they need to cooperate in resolving the interconnected challenges of the 21st century. (Global Education First Initiative, n.d.)

In a parallel development, the United Nations Environment Programme (UNEP) has developed a 10-Year Frame Work of Programmes (10YFP) Sustainable Lifestyles and Education Programme (SLE), jointly coordinated with UNESCO, which is part of the 10YFP on Sustainable Consumption and Production (SCP) as a global framework for international cooperation on SCP mandated at the United Nations Conference on Sustainable Development (Rio+20) (United Nations, 2012). In this programme, "Sustainable lifestyles are considered as ways of living, social behaviors and choices, that minimize environmental degradation (use of natural resources, CO<sub>2</sub> emissions, waste and pollution) while supporting equitable socio-economic development and better quality of life for all" (UNEP, 2014, p.1).

At the November 2014 conference marking the end of the Decade, held in Nagoya, Japan, UNESCO launched the Global Action Programme (GAP) on Education for Sustainable Development (UNESCO, 2014), which aims to actively integrate sustainable development into education. The GAP acknowledges that "sustainable development challenges have acquired even more urgency since the beginning of the Decade and new concerns have come to the fore, such as the need to promote global citizenship" (UNESCO, 2014, p. 33). It builds on the outcomes document of the United Nations Conference on Sustainable Development (Rio+20) (United Nations, 2012) where 'Member States agreed 'to promote education for sustainable development and to integrate sustainable development more actively into education beyond the United Nations Decade of Education for Sustainable Development' (UNESCO, 2013, Annex p.1). The first principle guiding the GAP is that

ESD allows every human being to acquire the knowledge, skills, values and attitudes that empower them to contribute to sustainable development and take informed decisions and responsible actions for environmental integrity, economic

viability, and a just society for present and future generations. (UNESCO, 2014, p.33)

Taken together, the foci for the UN Secretary-General's Global Education First Initiative, UNEP's Sustainable Lifestyles and Education Programme and UNESCO's GAP for ESD could be read in a positive light insofar as they acknowledge the need to achieve sustainable development, however they also reflect the changes in orientation between environmental education and ESD when it is compared with one of the goals for environmental education stated in the Tbilisi Declaration (and noted earlier): 'to provide every person with opportunities to acquire the knowledge, values, attitudes, commitment and skills needed to protect and improve the environment' (UNESCO, 1978, p.26). The Tbilisi goal at least acknowledges the need to protect and improve the environment and not just focus on human society. Some environmental education researchers have described this change from environmental education as consistent with globalisation, where they see the concept of SD as acting 'both as a product and as an agent of a globalization process embedded in neo-liberal economics' (Sauvé, Brunelle, and Berryman, 2005, p. 280). Bob Jickling and Arjen Wals (2008) take this further when they argue that

Globalizing ideologies and the corresponding material effects are also having an impact on education. The powerful wave of neo-liberalism rolling over the planet, with pleas for 'market solutions' to educational problems and universal quality-assurance schemes, are homogenizing the educational landscape (p. 2).

This is not the place to continue a discussion of neo-liberal globalisation in relation to education for sustainable development, but we believe that it is important to note that there is a critique of the neoliberal agenda of sustainable development and the cooption of education into this is neither recent nor welcomed by many researchers (see, for example, Hursh, Henderson and Greenwood, 2015 and other contributors to a recent special issue of *Environmental Education Research* on environmental education in a neoliberal climate), and this complements Nancy's and our concern that we need to recreate the world as a place for everyone while recognising that we are the place of transition.

Our purpose in this article has been to draw attention to the changing representations of 'environment' in international education for sustainable development and environmental education discourses that seem to be moving us away from a focus on human relationships with their environments toward a focus on cultural and economic relationships. We have drawn on the work of Jean-Luc Nancy to discuss the "dissipation of the certainties, images, and identities of what the world was with its parts and humanity with its characteristics" (Nancy, 2007, p. 34). The challenge for environmental educators is to (re)engage their programs with the ways in which the world is being technologically enframed and denatured,

problematize the principles underlying the UN Secretary-General's Global Education First Initiative, UNEP's Sustainable Lifestyles and Education Programme and UNESCO's GAP for ESD, and (re)assert the importance of the environment in environmental education.

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