Article

Educating for Sustainability:
Curriculum Reform in the Age of Environmental Crisis

Alexander Lautensach

School of Education, University of Northern British Columbia, Terrace, B.C. Canada V8G 1K7

E-Mail: alexl@unbc.ca

Tel.: +1-250-615-3334; Fax: +1-250-615-5478

Abstract: In the the present global environmental crisis people who contribute most to its causes are not the people who reap most of the resulting harms. The former tend to be well educated and hold positions of power or at least high levels of personal consumption. This points to a failure of education systems and institutions that cannot be ignored in the light of their potential to help and their responsibility to do so. In spite of numerous efforts to render education more conducive to sustainability, the problems are still widespread and time is running short. Extending on previous work, this paper presents the priorities for a curriculum that focuses on sustainability as the foremost educational aim. To make the case for the important role of education, a survey of determinant factors is presented that contribute to the counterproductive behaviour causing the crisis. The connection to education involves key ideological content of the hidden curricuum. I argue that through this connection education at all levels has contributed to environmental injustice by omission and commission, referring to education in Canada as a case in point. Addressing the failings of education through the lens of restorative justice we arrive at a new transdisciplinary curriculum that focuses on sustainable living and the restoration of damaged systems. Because the major obstacles to sustainability are ideological, the proposed curriculum emphasises values, attitudes and beliefs as a means to counteract counterproductive ideologies and help the learners to effectively change their lifestyles.

Keywords: environmental crisis; pedagogy; education for sustainability; hidden curriculum.

1. Introduction: The Behavioural Causes of the Global Environmental Crisis

Critical educational theorists have long complained that the aim of public education systems worldwide was primarily to reproduce and perpetuate existing power relationships rather than the transformation of societies toward the ideals of justice or even individual self-actualisation [1; 2]. Their arguments ranged from a libertarian critique of anti-meritocratic practices [3] through denouncing the active support by schools of oppressive mechanisms in society [4] to the advocacy of communitarian ends of education [5]. They share a reliance on principles of justice. The advent of the global environmental crisis and its interpretation as a crisis of sustainability addedd a new dimension to that critique, one that places part of the blame at the doors of public education [6]. This new angle of critique derives its urgency not only from the evidence of injustice but also from the crisis of sustainability. This paper presents the case for the culpability of education systems and suggests some priorities for addressing the problems through educational reform.

The well-documented manifestations of the current global environmental crisis include increasing rates of resource depletion, continuing out-of-control growth of the global human population, continuing pollution with its consequences on climate, habitat quality and public health. Furthermore, unprecedented rates of species extinctions are caused by the worldwide modification of ecosystems through habitat depletion, modification of landscapes and climate, and through species displacement [7; 8].

Overwhelming evidence suggests that the global environmental crisis is anthropogenic. Specifically, it is caused by five causative and self-reinforcing processes; they include economic growth, population growth, technological expansion, arms races, and growing income inequality [9; 10; 11]. Humanity is most likely now in a situation of *overshoot*, where unsustainable environmental impacts are eroding the source and sink capacities of ecological support structures [12; 7; 13]. Overshoot results if the signals that the system communicates back to a growing population are delayed, distorted, ignored or denied, which in turn causes detrimental behaviour to continue unchecked. Without discussing the evidence any further we will proceed on the assumption that the crisis is primarily caused by the decisions and actions of humans.

A closer look at those anthropogenic causes reveals a quantitative and a qualitative dimension. On the quantitative side, the logistic model of population growth implies that systemic constraints are bound to sooner or later limit the growth of any population, irrespective of individual or collective efforts to minimise demands on the ecosystem [14]. The qualitative dimension transcends the ecological model by revealing choices for human survival. At stake is not so much the survival of humanity *per se* but the individual's privilege of choosing among modes of survival [15]. Potter [16] distinguished between five kinds of survival: mere, miserable, idealistic, irresponsible, and acceptable. At this time in the history of the human species, an affluent minority is surviving comfortably though irresponsibly while the majority survives more or less miserably. The range of available options depends on our numbers but also on the values and priorities that guide our behaviour.

Accepting human behaviour as the primary cause of the crisis raises questions of justice. For example, to what extent do some people in this crisis experience disproportionate harm as a result of the behaviour of others? That would constitute injustice. Secondly, to what extent is the injustice

exacerbated by that behaviour being deliberate or negligent rather than inadvertent or unavoidable? We will address the latter question by examining what determines counterproductive human behaviour. Those determinants fall into two broad categories: conceptual blocks, mental habits and motivations defined by ideals, attitudes, values and paradigms on the one hand, and structural relationships inherent in the predominant socio-political and cultural frameworks on the other hand [9; 6]. One of the upshots of the longstanding debate on structure versus agency is the realisation that they reinforce each other at many levels. An attempt to demonstrate injustice needs to address ethical determinants of agency and structural determinants of behaviour, as do efforts to modify human behaviour at a large enough scale. However, in this essay I will focus on agency, for several reasons. First, human agency (decisions, actions, and behaviour) has received less attention in the literature on sustainability[1] than have structural constraints, structural violence and structural injustice. Secondly, among our professional expertise the prime impetus for this essay came from utilitarian and virtue-based ethics focused on agency. Thirdly, this paper focuses on the fields of educational practice and curriculum reform, fields that focus on human decision-making and its determinants in the developing individual.

Narrowing our scope of behaviour determinants to those inherent in the individual and his/her culture and peer groups, we can identify certain conceptual blocks, cognitive dysfunctions and counterproductive mental habits that prevent people from delaying an appropriate response to information about the crisis [19]. This includes, for example, the unwillingness to sacrifice for proactive gains [20]; trust in technological fixes [21]; limited capacity for learning and for flexible response [22]; culturally sanctioned unsustainable behaviour and counterproductive concepts of progress [14; 20] and our propensity to create myths and to rely on them for conceptual explanations and for normative justification and evaluation [23]. Those myths take the form of explicit values, attitudes, ideals, beliefs and paradigms that may have had some value in the past but that have outlived their utility in this crisis situation. They include the cornucopian belief in unlimited economic growth [24]; an ill-informed optimistic outlook on historical developments combined with a confidence in *laissez-faire* policies [25]; scientism and technologism [26]; moral nihilism and materialism [5]; consumerism [27]; freedom from nature and dominion over nature [28]; and the ethics of anthropocentrism [29]. Those myths often tend to exert their influence in the form of a counterproductive notion of what constitutes progress [30; 6].

Further cognitive dysfunctions, moral ineptitudes and mental habits constitute reasons for denying altogether that reliable information about the crisis exists [31; 32]. They include the inability to perceive one's environment in a holistic way [33]; the inability to extrapolate to global dimensions [20] and to the long term [31]; wishful thinking, self-deception, weakness of will (Aristotle's '*akrasia*') and groundless optimism [6]. These determinants can sometimes lead people into denying moral responsibility even when confronted with blatant evidence of injustice.

---

[1] I use the term sustainability as defined by Lemons [17], "the continued satisfaction of basic human physical needs, such as food, water, shelter, and of higher-level social and cultural needs, such as security, freedom, education, employment, and recreation", along with "continued productivity and functioning of ecosystems" (p. (198). In comparison, the popular 'Brundtland' definition of sustainability [18] seems less useful because of its lack of conciseness, inattention to metaethical considerations and its neglect of fundamental ecological limitations.

To the extent that those intrinsic determinants of behaviour are part and parcel of what passes for 'human nature' all of humanity is responsible for having contributed to the crisis. However, the greatest *per capita* contributions to the crisis come from individuals and communities with the greatest ecological footprints [34]. This includes citizens from rich countries where increasing individual consumption continues to widen the gap between the world's richest and its poorest. Furthermore, disproportionately greater contributions to the problems come from powerful corporations and governments whose leadership pursue agenda that cause pollution, deprivation, resource depletion and poverty. At the other end of this slanted spectrum of culpability lie the hapless members of future generations who will inherit from us a mess of unprecedented proportions and no recourse. Returning to our two questions probing for injustice we can unequivocally assert that disproportionate harm exists and that it is caused largely by negligence. Whatever the specific explanations for counterproductive and discriminatory behaviour may be, a considerable measure of injustice seems evident. But the injustice does not end there.

The vast majority of that leadership in industry and government consists of highly educated individuals, i.e. holding at least one university degree. A survey of the educational qualifications of the key decision-makers in the IMF, the WTO, and other political and commercial organisations showed that the vast majority of the directors whose qualifications are reported hold postgraduate degrees, mostly doctorates in economics [35]. This confirms Rolston's [36: 186] report of an 'inverse proportion' between the number of degrees a person holds and the degree of sustainability achieved by them. I know personally numerous individuals who hold PhDs but are not yet even recycling their household garbage.

Extrapolating from this admittedly small sample leads to the conclusion that the greatest amount of harm in this crisis is done by people with higher degrees, as was suggested by others [37; 38]. Their actions and decisions tend to contribute to a worsening of the crisis and a deepening of inequities and insecurity. The five self-reinforcing processes driving the crisis that we mentioned above are to a large part propelled by the ill-advised, short-sighted and self-serving decisions of this minority who collectively hold a considerable share of global political power.

By virtue of their educational backgrounds, professional competence and social status those individuals are privy to all the pertinent information regarding the consequences of their decisions. The explanations for their decisions and behaviour may lie within the range of behaviour determinants summarised above, but they can neither claim ignorance nor can they deny moral culpability. It seems that merely being informed about the crisis does not by itself dispose a person toward responsible behaviour. What, then, is primarily driving the decisions and the behaviour of this powerful minority? We propose that the primary drivers are values and attitudes. Everyday experience suggests that appeals to values and emotions go a long way to convince people whereas factual arguments tend to fail on morally significant issues [39; 40]. Also, aims that were converted from instrumental status to the status of end values through the process of goal displacement tend to gain influence on our decisions [6; 41]. Those observations, as well as abundant empirical evidence (e.g. [42]) suggest that values, attitudes and beliefs determine human behaviour more strongly than does propositional knowledge [30].

Another major contribution to the crisis obviously comes from larger parts of the population whose behaviour, through omission and commission, fuels those processes causative to the crisis [40]. But even those people tend to be citizens of OECD countries, and many of them have received some

postsecondary (tertiary) education. An empirical correlation appears evident between higher education and inadequate decision-making. The unsustainable and counterproductive behaviour of the vast majority of people in rich countries is informed by beliefs, attitudes and values that amount to a dominant concept of progress, related to Fien's [43: 23] 'dominant social paradigm'. It guides decisions and behaviour at the level of the individual, communities and societies, resulting in detrimental omissions and commissions [6].

To summarise so far, we claim that the global environmental crisis is more than an inevitable consequence of the collective ecological overshoot of humanity. It also manifests as a grave injustice. One reason is that the responsibility for the global environmental crisis and for all the suffering it brings to the world's destitute is not evenly shared by all of humanity. More of it lies with those individuals who consume more than the global average, and most of it lies with the tiny minority who hold the greatest decision-making power. The other reason regards the curious correlation between moral culpability and educational status. Educational systems worldwide have evidently failed to address the known determinants of counterproductive behaviour. It is this failure of education that we will focus on in the next section.

2. The Failure of Education

The evidence that a large number of well-educated people continue to make decisions that are blatantly counterproductive in the present situation indicates that somehow all that education has failed. This failure of higher education manifests itself in two ways. First, education results in the transmission of harmful or counterproductive values, beliefs and attitudes, or at least it fails to prevent their transmission through other avenues [44; 6]. This includes the teaching of a large amount of material that is factually wrong [45; 37] and the reproduction of the counterproductive values, attitudes, beliefs and paradigms mentioned above. Education also evidently fails to effectively counteract those more subconscious cognitive dysfunctions, mental habits and moral ineptitudes that we identified as contributing to counterproductive behaviour.

The second manifestation of failure lies in the inability of education to widely elicit alternative, more productive learning outcomes, namely basic ecological concepts and the values, beliefs and attitudes that would provide the basis for sustainable living [5; 46]. Summarising a substantial number of published analyses [6], the deficiencies of the current educational outcomes include a lack of the life skills required for a sustainable society of the future, few skills for moral reasoning, and inadequate analytical skills. Underlying these results is a general inattention to affective learning outcomes [47]. Value-related outcomes, wherever they are specified in prescriptive documents, are often not translated from ill-defined goal statements to specific instructional objectives and teaching methodology [6].

Accepting the correlation between higher education and bad decisions raises the question of causation. The answer to this question depends on what particular manifestation of the crisis we focus on, and at what scale. For example, the answer to the question whether inadequate education is causing global warming is arguably affirmative. Without being taught to hold unrealistic confidence in misleading conceptions of progress most of humanity would never have ended up in this insane rut of fossil fuel dependence. But is education also to blame for the loss of the Amazon rainforests? Here the causative connection seems more tenuous. Two important variables in this causation are the extent of power wielded by educated individuals in a particular context and the contribution made by formal

(postsecondary) education to the relevant attitudes and values of those individuals. What seems undisputable is that education systems worldwide could perform far better towards preventing and mitigating such manifestations of the crisis, as shown convincingly by Orr [46].

One might concede that false education contributes to the crisis, and one might even acknowledge the mitigative potential of educational reform, but one could still object to the idea of a moral duty for educators to make such attempts. I suggest that such a duty exists for three reasons. The first reason is based on the principles of non-maleficence and beneficence in medical ethics. The principles of medical ethics seem applicable to education because the relationship between the learner and the teacher bears a fair resemblance to that between the patient and the doctor [48].

The second reason for a moral duty of educators rests on intergenerational justice which places a moral duty on every individual not to negligently jeopardise the security of future generations. Because of the amount of influence that educators wield over the moral basis of behaviour in their graduates, this duty is greater with educators than with many others. Through omission and commission, present educational practices violate this duty by contributing to the crisis.

In the Canadian context, concrete documentation on the failure of educational institutions can be found in their mission statements, as was done in a study [49] of relevant documents from five Canadian universities, from the BC Ministry of Education's online resources, the British Columbia College of Teachers, as well as the Council of Ministers of Education**,** Canada**.** Several distinct definitive views of the institutional *raison d'etre* were identified. They included **e**cocentric motto and goal statements; acknowledgement of overarching critical challenges but omitting any reference to the global environmental crisis; sweeping recognition of the sustainability imperative, but little follow-up into policy and curriculum; **v**ague allegiance to ideals of social justice and to undefined concepts of sustainability and progress**; e**mphasis on well-organised continuation of business as usual and traditional obligations without reference to ongoing changes in context; and an **e**mphasis on optimising pedagogical methods and academic skills with vague reference to 'service to society' and no mention of changing global imperatives. Some institutions specified no overarching institutional mission, indicating a parochial fragmentation of ethical priorities along disciplinary boundaries. Still others abrogated all wider ethical considerations outside the interests of the peer group of professionals.

Those definitive views have in common one of two positions. One was to abrogate wider responsibilities to society and the biosphere by emphasising pedagogical, technical, economical, and scientific agenda. This position clearly involves some of the determinants of counterproductive behaviour that were mentioned earlier, and it violates professional duty for the reasons stated above. The alternative position was to admit to some kind of public responsibility in vague, superficial statements but without translating those goals into policy. Here the duty exists not only for the two stated reasons but also because the institution explicitly professed to it. Both positions mark a failure to meet the institution's moral obligations as laid out above. Denying one's responsibility in the face of clear evidence of powerful capability and deep effects of one's actions amounts to a moral cop-out. Admitting responsibility without acting accordingly seems no less objectionable. Either mode of conduct is equivalent to educational malpractice [50; 51].

In the first section I proposed that injustice by omission and commission is evident in the way that a relatively affluent minority of humanity contributes disproportionately more to the worsening of the global environmental crisis and receives disproportionately less of the resultant harm. A second manifestation of injustice lies in the failure of education systems, despite adequate funding and

information, to counteract those determinants of behaviour that evidently drive the crisis. This injustice involves again omission and commission, and it is aggravated by the failure by some educational institutions to perform up to their own mission statements and by others denying moral responsibility. How, then, might this injustice best be addressed? The first manifestation seems quite intransigent to simple policy measures but the second holds more promise; the failure of education can be addressed by educational reform.

3. Priorities for Educational Reform

Among the many opportunities to apply restorative justice to address the harm caused by the crisis, we focus on the educational sector for three reasons. As we established in the preceding section, it carries a good deal of culpability by failing to teach the right outcomes, by teaching the wrong outcomes, and by failing to deliver according to its aims. We also established that the most important educational outcomes in this context are affective ones[2], including values, attitudes, ideals and unexamined beliefs, because they strongly determine human behaviour. Our values, attitudes and beliefs are formed largely by our culture which, according to Geertz's [54: 261] definition as "the shared patterns that set the tone, character, and quality of people's lives" functions as a body of programs which provide a template for the organisation of social and psychological processes in the individual and in society. The early foundations for core values are laid down during primary socialisation, a good portion of which takes place in the course of formal education [30; 5].

A second reason why we focus on formal education as a value-determining process is that it is subject to public scrutiny and political control, and can be deliberately modified through policy reform. Obviously, important values are also acquired prior to and outside of formal education through the media, the entertainment industry and general cultural influences. However, this fact in turn provides a further justification why educators ought to use their influence on the learner to counteract what negative values are reaching the learner through those other channels. Such 'informal education' cannot be directly controlled through policy, whereas formal education can be.

Thirdly, formal education in values, attitudes and beliefs has a considerable potential to make a valuable contribution. The pursuit of affective objectives has been traditionally neglected in favour of cognitive and psychomotor objectives. They are underrepresented in most curriculum documents and in curriculum planning and they are largely ignored in the assessment of the learner [5]. On the other hand, the transmission of values during education is inevitable. It proceeds through implicit value judgements and value priorities contained in the stated aims - the so-called 'hidden curriculum' [55]. Another contribution comes from value-related issues that are being deliberately avoided and that carry a negative significance (the 'null curriculum'). By relegating the transmission of affective outcomes to the realms of the implicit, the unplanned, and the unconsidered, educators forego an opportunity (and renege on their professional obligation) to help the learners to acquire those values and attitudes that are most likely to benefit them in their future lives [30].

The fact that the acquisition of values in formal education is both highly significant and inevitable suggests that the much-touted ideal of a 'value-neutral' curriculum is not only undesirable but also impossible to achieve [56; 57; 58]. While the acquisition of specific attitudes and values by the learner

---

[2] In the widely used taxonomy of educational objectives by Benjamin Bloom educational outcomes are classified into cognitive, affective and psychomotor domains. [52; 53]

as a result of deliberate teaching efforts is not without practical difficulties, a curriculum that takes into account affective outcomes is bound to enjoy greater success with the learner, if only because it communicates more sincerity. Also, affective outcomes can be effectively pursued through a considerable range of teaching methodologies, as illustrated specifically by those that pertain to sustainability [59; 60].

I shall now present a summary overview of a plan for curriculum reform designed to address the problems laid out earlier. A more detailed account with a more pedagogical focus has been presented elsewhere [6], where one overarching goal of the proposed curriculum was presented as laying the moral groundwork for a globally sustainable society, with the transition being informed by the ideals of efficiency, restraint, adaptation and structural reform. In behavioural terms, those ideals define the perspective of the proposed curriculum. A second overarching goal is to create motivation in the individual towards paying restitution to ecosystems, threatened species and environmentally disenfranchised communities in compensation for past wrongdoings. This goal is informed by the realisation that at this advanced stage of the crisis, aiming merely for sustainability will no longer suffice. Instead, the curriculum aims at a reformulation of what constitutes progress, which accords with the opinions of many environmental educators [42], and it resonates with the goal and vision in the United Nations' plan for a Decade of Education for Sustainable Development (2005-2014).[3]

In order to pursue those goals effectively, the reform of education has to address the causes for its current failure as outlined above. This means for educational institutions to stop teaching counterproductive beliefs and values, and to teach appropriate concepts and values more effectively. A third agendum arises out of considerations of tactical expediency and distributive justice, namely to implement a pedagogy of liberation.

In order to stop teaching counterproductive beliefs and values, an educational program in pursuit of sustainability will need to effectively counteract the dominant concept of progress [43; 49]. That requires that it interferes with certain systemic mechanisms of ideological reproduction. This can be accomplished in two ways. Firstly, educational reform must counteract the hegemonic influence of ideologies that serve to perpetuate the dominant concept of progress. They include many of the determinants of counterproductive behaviour that we discussed above. Secondly, the perpetuation of anthropocentric values needs to be prevented. This argument is presented in more detail elsewhere [29]. The required shift towards more ecocentric ethics relies on to a large extent value education. It amounts to a moral paradigm shift that extends beyond environmental values into how we conceptualise the moral position of humanity in the world.

To teach appropriate concepts and values more effectively requires foremost a clear strategy and a determined effort to re-prioritise learning outcomes. They need to favour an environmental ethic that is consistently ecocentric, as well as beliefs and attitudes of the new ecological paradigm [43] which is to replace the dominant social paradigm. They include dependence on nature, integration within the natural environment, recognition of natural limits to consumption and to technological development, concern for future generations and respect for nature [61]. Specific cognitive skills and reflective

---

[3] The decade of 2005-2014 has been designated the United Nations Decade of Education for Sustainable Development. Its overall goal is to 'integrate the values inherent in sustainable development into all aspects of learning to encourage changes in behaviour that allow for a more sustainable and just society for all.' Its basic vision is 'a world where everyone has the opportunity to benefit from education and learn the values, behaviour and lifestyles required for a sustainable future and for positive societal transformation'. See http://www.phase2.org/undesd.cfm

attitudes are to address the counterproductive mental habits discussed above. The cognitive domain should also include a transdisciplinary emphasis on ecological principles, on the crisis itself [58] and on current trends and probable future scenarios [62; 63]. Learners need to become competent in finding new solutions with the help of new values and new assumptions. However, none of this guarantees that the learner will actually act on such insights. This requires a pedagogy of liberation.

Unlike the more passive transition to post-industrial society, achieving a sustainable society requires a transformative effort [63: 196]. Social transformation will require a sufficient contingent of competent graduate transformers. The abovementioned two reform agenda of ceasing the reproduction of counterproductive ideologies and of teaching appropriate objectives in more effective ways do not go far enough here. The proposed pedagogy of liberation is designed specifically to help empower and motivate the learner towards taking action. Unless the learner is prepared to think and act for him/herself on the basis of recent learning, neither can the reasons for overshoot be entirely eliminated, nor can we expect to win the race against time. Without that liberation, exploitative dependencies acting from within the learner and structural constraints acting from without would continue to hinder any deliberate shift to more sustainable living. Those dependencies are an inevitable outcome of enculturation and constitute a web of habits, institutional relationships and ideologies that govern the learner's interactions with society – such as consumerism, the work ethic and misguided theories of progress. For most people this web of dependencies makes it virtually impossible to adopt a sustainable way of life unless they free themselves of at least some of those conceptual constraints and replace them with more helpful relationships [27]. Without receiving some directed help through education, the learner is unlikely to accomplish that.

Liberation pedagogy also addresses those existing power imbalances that are ill-suited to mitigate the situation and that often constitute part of the problem. The global economic system has placed severe limitations on the consumer in terms of real choices, without any political mandate to do so, and to the detriment of the public good. The liberalisation of trade, the privatisation of state assets and the commodification of nature under the dominant concept of progress have led to intensified destruction of ecosystems and resource depletion worldwide. This imposition of socio-political and socio-economic contexts on humans by other humans with the effect that short-sighted exploitative behaviour becomes their only possible course of action constitutes an act of oppression [64]. The educational reforms proposed here are designed to liberate the learner from the influences of the dominant paradigms and from structures that perpetuate those internal dependencies and external constraints.

The purpose of this liberation is not only to enable the individual learner to change his or her ways of living, it is the destabilisation in the long term of those oppressive structures and relationships to prevent backlashes. In this counter-hegemonic mission our proposed pedagogy resembles the liberation pedagogies advocated by the Freirian school of critical theorists [4]. As with the political oppression targeted by the Freirians, the mechanism of the oppression relies on a rigidly hierarchical system where almost everybody acts as the oppressor as well as the oppressed [65].[4] The oppression

---

[4] As Foucault has observed in another context, only a very small minority, situated at the top of the societal pyramid, engages in oppressive behaviour out of a conscious choice they made free from duress. By his or her own habitual (and at times compulsive) patterns of consumption, a consumer at once contributes toward the oppression of others and is being oppressed. At the same time, the consumer is continuously assured by advertising that the road toward maximising their personal freedom (another unquestioned ideal) is built on maximum consumption, and, worse, that failure to follow this course will result in loss of face. In this way, most members of consumer societies have become both oppressed and

operates through and results in alienation (from the environment as well as from each other) and fragmentation rather than solidarity. It invades the culture of the oppressed (as seen, for instance, in the 'branding' of teenagers and the encouragement of indifference towards the welfare of animals) and silences their personal voices. It can manifest itself in exploitation, marginalisation, powerlessness, cultural imperialism, and violence [65]. It forces individuals to follow prescriptions (those of consumers) and to become spectators instead of actors. It replaces the freedom to act with "the illusion of acting through the action of the oppressors" [4: 33]. Public education at this stage plays an essential part in habituating the young learner to this situation and in achieving compliance [66; 67; 1; 68; 6]. Counter-hegemonic education aims to accomplish the opposite, to relieve the learner from this habituation to oppression.

How can education be expected to bring about this liberation? As Paolo Freire [4] noted decades ago, education systems are largely ill-equipped to tackle oppressive political situations. In the absence of effective political support from the authorities, educator and learner have to transcend this oppressive situation by working together through a process referred to by the Freirians as *conscientisation*. It involves a set of educational strategies resulting in the empowerment of the learner and in the achievement of a critical consciousness. This critical consciousness will permit and ensure the unmasking of oppressive structures, and it is relevant wherever such oppressive structures exist. Through the process of conscientisation the learner becomes empowered to take action and to engage in attempts to convince others of her newfound views. The empowerment of the learner represents an important aim of educational reform towards sustainability. Empowerment is one of six general aims in the proposed curriculum as summarised in the next paragraph; but the agenda of liberation reach into all the other aims, as effective progress towards them depends to a large extent on the learner's ability to re-examine her own values and beliefs, and to take action.

The proposed curriculum is organised into six general aims, each encompassing distinct groups of learning outcomes; they are described in more detail elsewhere [6]. The aims include the adoption of a concept of progress that is informed by sustainability; the replacement of anthropocentrism with an ecocentrist environmental ethic; the acquisition of requisite skills; a vision for and awareness of the future that includes change and sustainable solutions; a non-parochialist view of environmental values and academic inquiry; and the liberation from exploitative dependencies. The proposed curriculum follows the recommendation made by others [63; 60] for a curriculum for ecological education to be multilevel, interdisciplinary, problem-centred, future-oriented, global, and humanistic.

Across those six general aims extend as common threads the three abovementioned agenda of counteracting undesirable educational outcomes, encouraging such outcomes as are conducive to the general aims, and empowering the learner to take action. Besides the three agenda, other features common to the general aims include the emphasis on ideological change, the prevalence of values and attitudes among educational outcomes, and a propensity for action informed by those values. Detailed descriptions and explanations of those general aims, their respective learning outcomes and suitable teaching methodology were published elsewhere [6].

The chances of success of any educational reform can be increased if it anticipates and pre-empts political opposition. Revolutionary changes are frequently threatened by backlash effects, and

---

oppressors. An analogous effect, where some members of a disadvantaged gender oppressing their fellow victims, has been recognised in the feminist literature.

contemporary movements such as environmentalism and feminism are no exception. Our proposed pedagogy seeks to develop a critical consciousness that will put into question the 'business as usual' approach to 'development' and that will fundamentally challenge the social values, structures, authorities and conventions that support that approach. Specifically, it is set to destabilise the conceptual straitjacket imposed on the education sector by the globally dominant ideology of progress, as well as the uncritical reproduction of that straightjacket by the education sector itself. This is likely to attract political countermeasures similar to the greenwash and brownlash tactics encountered by the environmental movement [69; 70; 71]. The ability of the learner to recognise and accurately assess such tactics, to interpret media reports correctly, and to attempt her own, deeper analysis, relying on cognitive skills and affective dispositions represents an important component in her empowerment.

4. Conclusions

As with most calls for curriculum reform, this one arose from an impression of inadequacy in educational practice and learning achievement. However, such purely educational concerns pale in comparison to the pressing need for addressing the greatest challenge humanity has ever faced. The global environmental crisis represents both a scourge and an opportunity. It has been allowed to gain momentum because our behaviour is still largely determined by factors that have remained unaddressed. Those factors include negligent or irresponsible decision-making, inadequate education and oppressive power relationships worldwide. What connects those causes is the common element of injustice in its structural and agency-related dimensions. Accordingly, in this plan to address those problems I take the approach of restorative justice. It promotes ecological security and addresses recurrent problems of unsustainable behaviour by empowering graduates to question the root causes of the crisis – the effects of economic growth, population growth, technological expansion, arms races, and growing income inequality – and to act on their newfound insights.

This proposed pedagogy for sustainability contains several major themes. Firstly, it takes a holistic approach across all the dimensions of human development: the intellectual, emotional, spiritual, moral and physical. It extends over all academic disciplines. It also takes a global focus, despite the national idiosyncrasies of public education systems and the ultimately local or national character of educational reform, because only a global vision can inform appropriate local measures [60]. The overarching aim of this program of educational reform is to facilitate a sustainable existence of acceptable quality for the species *Homo sapiens* on the planet Earth and to balance that priority against its impact on non-human nature. The fact that specific regional ecological, cultural, political and individual conditions may differ in their conduciveness towards that aim does not take away from its global applicability. That is to say, no region, community, culture or individual should be entirely exempt from the obligation to help. But beyond that global obligation we recognise differences in degrees of obligations, in potentials for improvement, and in potentials for making a difference. Those differences may be geographical, national, cultural and individual in nature, making the pedagogy applicable in variable ways to teachers and learners worldwide.

Secondly, this pedagogy clearly emphasises values. Many analyses of the crisis and its causation (reviewed in [6]) indicated that without a change in prevailing values the crisis could not be effectively addressed. And since value education is possible, desirable, and practical, the onus for taking action lies with educators. As far as educational solutions are concerned, affective learning outcomes thus

must take priority over cognitive ones. Others have come to similar conclusions [2; 72; 22; 73]. In many respects, affective learning outcomes can be considered the most important results of the educational process because they render other outcomes more achievable [59; 74]. Nevertheless they have largely remained implicit or neglected altogether in Canadian curricula – the BC Ministry of Education's integrated resource packages are a case in point - and elsewhere.

A third recurrent theme in this pedagogy is its critical orientation with respect to dominant ideologies. The current widespread emphasis in postsecondary education on discipline mastery has served to reinforce the dominant ideologies of progress and anthropocentrism through habituation via the hidden curriculum. The curriculum advocated here is oriented towards ecological validity and sufficiency, focussing on destabilising the dominant anthropocentric ideology of progress. This destabilisation of a hegemonic ethic and its replacement with an ecocentric alternative [75; 29] becomes possible when a sufficient number of learners develop a critical consciousness, which empowers them to take action.

The emphasis on the need for action represents another major theme in our pedagogy for sustainability. Taking the step towards action requires that the learner feels confident, safe and competent to do so. This feeling is predicated on a certain degree of liberation from dependencies of habit, ideology, institutional context and the associated injustice. The most significant element in those agenda of liberation is the subversion of consumerism and the mitigation of the conceptual and moral constraints it imposes on communities and individuals. In that sense the pedagogy promotes justice and calls for strategies and methods adopted from Freirian liberation pedagogy. Critical pedagogy contributes a significant body of theory on the empowerment of the learner; and it provides a modicum of counterbalance to the influence of technocratic educators who have dominated the professional development and training especially of new teachers [30; 60]. It is to be hoped that in combination with its other elements the proposed pedagogy will allow our learners to build on those contributions and effectively address the global environmental crisis.

Acknowledgments

Conflict of Interest

The author declares no conflict of interest.

References and Notes

1. McLaren, P. (1989). *Life in schools*. NewYork: Longman.
2. Giroux, H.A. (1981) *Ideology, culture and the process of schooling*. Lewes, UK: The Falmer Press.
3. Hurn, C.J. (1993). *The Limits and Possibilities of Schooling: An Introduction to the Sociology of Education*. Boston: Allyn & Bacon.
4. Freire, P. (1986) *Pedagogy of the oppressed*. New York: Continuum Pub. Co.
5. Postman, N. (1997) *The end of education: Redefining the value of school*. New York: Alfred Knopf.
6. Lautensach, A. (2010). *Environmental Ethics for the Future: Rethinking Education to Achieve Sustainability*. Saarbruecken,Germany: Lambert Academic Publishing.
7. McMichael, A.J. (2001) *Human frontiers, environments and disease : past patterns, uncertain futures*. Cambridge : Cambridge University Press.

8. UNEP-MAB (Millennium Assessment Board). (2005) *Living Beyond Our Means: Natural Assets and Human Well-being*. London: UNEP-WCMC.
9. McMichael, A.J. (1993) *Planetary overload : global environmental change and the health of the human species*. Cambridge, UK: Cambridge University Press.
10. Furkiss, V. (1974) *The future of technological civilisation*. New York: Braziller.
11. Coates, J.F. (1991) "The sixteen sources of environmental problems in the 21st century". *Technological Forecasting and Social Change* 40: 87-91.
12. Catton, W.R. Jr. (1980) *Overshoot: The ecological basis of revolutionary change*. Urbana: University of Illinois Press.
13. Wackernagel, M., Schulz, N.B., Deumling, D., Linares, A.C., Jenkins, M., Kapos, V., Monfreda, C., Loh, J., Myers, N., Norgaard, R., & Randers, J. (2002) „Tracking the Ecological Overshoot of the Human Economy". *Proceedings of the National Academy of Sciences (USA)* 99(14), 9266-9271. http://www.pnas.org/cgi/reprint/99/14/9266.pdf (accessed 8 Feb 08)
14. Ehrlich, Paul R., Ehrlich, A.H. and G.C. Daily. (1995) *The stork and the plow*. New York: G.P. Putnam's Sons.
15. Cohen, Joel E. (1995) *How many people can the earth support?* New York: W.W. Norton & Co.
16. Potter, Van Rensselaer. 1988. *Global Bioethics: Building on the Leopold Legacy*. Easdt Lansing, MI: Michigan State University Press.
17. Lemons, J. (1996) "Afterword: University education in sustainable development and environmental protection". In *Earth summit ethics: Toward a reconstructive postmodern philosophy of environmental education*. Callicott, J.B. and F.J.R. da Rocha (eds) 193-217. Albany New York: State University of New York Press.
18. WCED (World Commission on Environment and Development). (1987) *Our Common Future: The Brundtland Report*. Oxford: Oxford University Press.
19. Lilienfeld, Scott O., Ammirati, Rachel, and Kristin Landfield. 2009. "Giving debiasing away: Can psychological research on correcting cognitive errors promote human welfare?" *Perspective on Psychological Science* 4 (4): 390-398.
20. Caldwell, Lynton K. (1999) "Is humanity destined to self-destruct?" *Politics and Life Sciences* 8 (1) (March): 3-15. Also at http://www.indiana.edu/~speaweb/perspectives/humanity.html (last accessed 20 Sept. (2001)
21. Ellul, Jacques. (1964) *The technological society*. New York, A.A. Knopf.
22. Toffler, Alvin (ed). (1974) *Learning for tomorrow: The role of the future in education*. New York: Random House.
23. Rees, William. 'Waking the Sleepwalkers – Globalisation and Sustainability: Conflict or Convergence'. In *The Human Ecological Footprint*. Guelph, Canada: University of Guelph, pp.1-34, 2004.
24. Ehrlich, Paul R. and Holdren, J. (1971) "The Impact of Population Growth". *Science* 171: 1212-1217.
25. Gray, John. (1998) *False dawn: The delusions of global capitalism*. London: Granta Books.
26. Berry, Wendell. *Life is a miracle*. Washington, DC: Counterpoint 2000.
27. Ekins, P. (1998) "From consumption to satisfaction". *Resurgence* 191 (November/December): 16-19.
28. Catton, W.R. Jr. and R.E. Dunlap. (1980) "A new ecological paradigm for the post-exuberant society". *The American Behavioural Scientist* 24 (1): 15-47.
29. Lautensach, A. (2009) "The ethical basis for sustainable human security: A place for anthropocentrism?" *Journal of Bioethical Inquiry* 6 (4): 437-455.
30. Bowers, C.A. (1993) Education, cultural myths, and the ecological crisis: Toward deep changes. Albany, NY: State University of New York Press.
31. Gordon, A. and Suzuki D. (1990) *It's a matter of survival*. North Sydney, NSW: Allen & Unwin Pty Ltd.

32. Hodgkinson, Shari P. and J. Michael Innes. (2000) "The prediction of ecological and environmental belief systems: The differential contributions of social conservatism and beliefs about money". *Journal of Environmental Psychology* 32(3): 285-294.

33. Forrester, Jay W. (1971) "Counterintuitive behaviour of social systems". *Technology Review* 73 (3) (January): 52-68.

34. Wackernagel, Mathis, P. Werner & S. Goldfinger. (2007) 'Introduction to the ecological footprint.' *Internet Encyclopaedia of Ecological Economics.* http://www.ecoeco.org/pdf/footprints.pdf

35. Lautensach, A. & S. W. Lautensach. 2010. "Teaching for Sustainability: Curriculum Reform in the Age of Environmental Injustice". *International Journal of Arts & Sciences* vol. 3 (14): 195-214.

36. Rolston, H., III. (1996) "Earth ethics". In *Earth summit ethics: Toward a reconstructive postmodern philosophy of environmental education*. Callicott, J.B. and F.J.R. da Rocha (eds), 161-192. Albany New York: State University of New York Press.

37. Orr, D.R. (1999) "Education for globalisation". *The Ecologist* 29(2) (May): 166-168.

38. Priesnitz, W. (2000) *Challenging assumptions in education – From institutionalised education to a learning society.* Toronto: The Alternate Press.

39. Ehrlich, P.R. and Ehrlich, A.H. (1990) *The population explosion*. New York: Simon and Schuster .

40. Cosgrove, L., Evans, D., & D. Yencken (Eds.). (1994) *Restoring the land: Environmental values, knowledge and action*. Melbourne University Press.

41. Wenz, Peter. (1988). *Environmental justice*. Albany, New York: State University of New York Press.

42. Nicholson-Lord, D. (2001) "Green scene". *Resurgence* 201 (July/August): 10-16.

43. Fien, J. (1993) *Education for the environment: Curriculum theorising and environmental education*. Geelong, Victoria, Australia: Deakin University Press.

44. Postman, N. and C. Weingartner. (1969) *Teaching as a subversive activity*. Harmondsworth, UK: Penguin.

45. Orr, D.R. (1992) *Ecological Literacy: Education and the transition to a postmodern world*. Albany, New York: State University of New York Press.

46. Orr, David R. (2004) *Earth in Mind: On education, environment and the human prospect*. Washington DC: Island Press

47. Van Matre, S. (1990) *Earth Education ... A New Beginning*. Greenville, W.VA: The Institute for Earth Education.

48.   Goodlad, J.I., Soder, R. & Sirotnik K.A. (1990). *The moral dimensions of teaching*. San Francisco: Jossey-Bass.

49. Lautensach, A. and S. Lautensach. (2010). "A Curriculum for a Secure Future: Agenda for Reform". In Suoranta, Juha, Houston, Donna, Martin, Gregory & Peter McLaren (Eds.). The *Havoc of Capitalism: Educating for Environmental and Social Justice*. Sense Publishers.

50. Foster, William F. (1985) "Educational malpractice: A tort for the untaught". *University of British Columbia Law Review* 19 (2): 161-244.

51. Standler, Ronald B. (2000) "Educational malpractice in the USA". http://www.rbs2.com/edumal.htm

52. Bloom, Benjamin.S. (ed.). (1956) Taxonomy of Educational Objectives: The Classification of Educational Goals. Susan Fauer Company, Inc.

53. Anderson, Lorin W., David R. Krathwohl, Peter W. Airasian, Kathleen A. Cruikshank, Richard E. Mayer, Paul R. Pintrich, James Raths and Merlin C. Wittrock (Eds.). (2001) *A Taxonomy for Learning, Teaching, and Assessing — A Revision of Bloom's Taxonomy of Educational Objectives*; Addison Wesley Longman, Inc.

54. Geertz, Clifford. (1972) *The interpretation of cultures*. New York: Basic Books.

55. Contenta, Sandro. (1993) *Rituals of failure: What schools really teach*. Toronto: Between the Lines.

56. Rich, John M. (1968) *Education and human values*. Philadelphia: Addison-Wesley Pub. Co.

57. Lickona, T. (1991). *Educating for character: How our schools can teach respect and responsibility*. Toronto: Bantam Books.

58. Madsden, P. (1996) "What can universities and professional schools do to save the environment?" In *Earth summit ethics: Toward a reconstructive postmodern philosophy of environmental education.* Callicott, J.B. and F.J.R. da Rocha (eds), 71-91. Albany, New York: State University of New York Press.
59. Caduto, M. (1983) A review of environmental values education. *Journal of Environmental Education, 14*(3), 12-18.
60. Lloyd, D.G., R. Smith, & K. Paige. (2011). Education and Sustainability in Teacher Education: First Moves and Pedagogy. *International Journal of Environmental, Cultural, Economic, & Social Sustainability* 7 (3): 65-90.
61. Taylor, P. (1986) *Respect for nature: A theory of environmental ethics*. Princeton, NJ: Princeton University Press.
62. Delcourt, P. & Delcourt, H. (2000) *Ten personal strategies for living well in an age of global warming*. White River Junction, Vermont: Chelsea Green Publishing.
63. Perelman, L.J. (1976) *The global mind: Beyond the limits to growth*. New York: Mason Charter.
64. Barber, B.R. (1998) *A place for us*. New York: Hill and Wang.
65. Young, I.M. (1992) "Five faces of oppression". In *Rethinking power.* Wertenberg, T.E. (ed). Albany New York: State University of New York Press.
66. Galbraith, J.K. (1984) *The anatomy of power*. London: Hamish Hamilton.
67. Beder, S. (2000) *Selling the work ethic: From Puritan pulpit to corporate PR*. Sydney and London: Scribe Publications and Zed Books.
68. Bowles, S., and H. Gintis. (1976) *Schooling in capitalist America: Educational reform and the contradictions of economic life*. New York: Basic Books.
69. Beder, Sharon. *Suiting themselves: How corporations drive the global agenda*. London: Earthscan, 2006.
70. Edwards, D. (1998) "Can we learn the truth about the environment from the media?" *The Ecologist* 28 (1) (January/February): 18-22.
71. Suzuki, D. and Dressel, H.. (2002) *Good news for a change: Hope for a troubled planet*. St.Leonards, NSW: Allen & Unwin.
72. Sylvan, R. and Bennett, D. (1994) *The greening of ethics*. Cambridge, UK: The White Horse Press.
73. Bosselmann, K. (1995) *When two worlds collide - Society and ecology*. Auckland: RSVP Publ. Co.
74. Oakes, J. & Lipton, M. (2007). *Teaching to change the world.* Boston: McGraw Hill.
75. Curry, Patrick. (2011). *Ecological Ethics: An Introduction*. Cambridge, UK: Polity Press, 2nd ed.