



“Sustainability” in higher education: from doublethink and newspeak to critical thinking and meaningful learning

Arjen E.J. Wals^{a,*}, Bob Jickling^b

^a*Communication & Innovation Studies Group, Department of Social Sciences, Wageningen University, Hollandseweg 1, 6706 KN Wageningen, Netherlands*

^b*Arts and Science Division, Yukon College, P.O. Box 2799, Whitehorse, Yukon, Canada Y1A 5K4*

Abstract

It is higher education's responsibility continuously to challenge and critique value and knowledge claims that have prescriptive tendencies. Part of this responsibility lies in engaging students in socio-scientific disputes. The ill-defined nature of sustainability manifests itself in such disputes when conflicting values, norms, interests, and reality constructions meet. This makes sustainability—its need for contextualization and the debate surrounding it—pivotal for higher education. It offers an opportunity for reflection on the mission of our universities and colleges, but also a chance to enhance the quality of the learning process. This article explores both the overarching goals and process of higher education from an emancipatory view and with regard to sustainability. © 2002 Published by Elsevier Science Ltd. on behalf of International Association of Universities.

1. Sustainability = growth: Orwell's cautionary tale

Over the past decade there has been much talk, and some lively debate, over the terms “sustainable development” and “sustainability”. This includes a Canada-hosted on-line colloquium on the future of environmental education with a selection of papers published in Volume 4 of the Canadian Journal of Environmental Education (1999) and in the monograph that resulted from the colloquium (Jarnet, Jickling, Sauv e, Wals, & Clarkin, 2000). More recently, another internet debate on education for sustainable development was initiated by the Dutch Inter Departmental Steering Group on Environmental Education (Hesselink, van Kempen, & Wals, 2000). Beginning with the report

* Corresponding author.

E-mail addresses: arjen.wals@alg.vlk.wag-ur.nl (A.E.J. Wals), jickling@yknet.yk.ca (B. Jickling).

of the World Commission on Environment and Development (1987) and followed by Agenda 21 (UNCED, 1992), signed by 179 nations in Rio, adherents of sustainable development and sustainability have had some momentum in their efforts to establish guidelines and goal statements.

Not surprisingly the education community is divided on how to respond to the emergence of “education for sustainability”. Some appear quite comfortable with the term and seek to infuse this term with meaning, or use it to address issues under-represented by traditional environmental education (Huckle, 1999; González-Gaudio, 1999; Gough & Scott, 1999). Others, who clearly are uncomfortable with the continued sustainability focus (Sauvé, 1996, 1999; Berryman, 1999), express concerns about the “globalizing” nature of the “education for sustainability” agenda and stress the need to nurture alternative perspectives. A third group, while recognizing limitations to this terminology, seeks means to accommodate the global political agenda (i.e. Smyth, 1999). As a tentative step in this direction, Smyth speaks about “education consistent with Agenda 21”. As these examples illustrate, there are multiple perspectives on sustainability, education for sustainable development, and education for sustainability and multiple perspectives on the way educators should interpret these ideas.

Sustainability is, in many ways, an important term. Many ecological processes are not sustained. Species are going extinct at an alarming rate and whole ecosystems are at risk. However, the degree to which it remains helpful from an education perspective depends on how well we recognize its shortcomings as an organizing concept. At least two potential pitfalls of a sustainability-focussed agenda can be put forward (Jickling, 1999): (1) The idea of sustainability is conceptually flawed. Literally it means to keep going continuously. Yet, it provides no inherent clues about how one should mediate between contesting claims between advocates of incompatible value systems. At the level of common understanding, it masks a whole epistemological layer. While sustainability has clear meaning in particular contexts, as an aim it is dubious. (2) Education for sustainability runs counter to prevailing conceptions of education: it breathes an intellectual exclusivity and determinism that conflict with ideas of emancipation, local knowledge, democracy and self-determination. The prepositional use of “for” prescribes that education must be in favor of some specific and undisputed product, in this case sustainability. At the same time an emphasis on sustainability, or sustainable development, might hinder the inclusion of other emerging environmental thought such as; deep ecology and ecofeminism. If environmental thought and ethics are evolving processes, then one task of higher education is to engage students in this process (see Weston, 1992, 1996a, b). Moreover, if environmental thinking is to continue evolving, and if students are to be participants in an environmental discourse unimagined today, then we must resist temptations to exclude a wide suit of emerging ideas in favor of a sustainability or sustainable development agenda. We also want them to be exposed to a diversity of ideas.

It is not uncommon to find that scientific, political and symbolic meanings of sustainability are used interchangeably by one and the same person or group. Both the knowledge base and the value base of sustainability are variable, unstable and questionable. Although these characteristics of sustainability can render the concept useless or reduce it to a rhetorical instrument, they can also add to its strength when handled with

care. Sustainability talk potentially brings together different groups in society searching for a common language to discuss environmental issues. Where different ways of looking at the world meet, dissonance is created and learning is likely to take place—so called: “learning on the edge”. This dialogue also allows the socio-scientific dispute character of emerging knowledge and values to surface. Participation in such a dispute is an excellent opportunity to learn about a highly relevant, controversial, emotionally charged and debatable topic at the crossroads of science, technology and society (see also Dreyfus, Wals, & van Weelie, 1999).

At the same time sustainability talk can, when used by advocates with radically different ideas about what should be sustained, mask central issues under the false pretense of a shared understanding, set of values and common vision of the future. However, critical thought depends on transcendent elements in ordinary language, the words and ideas that reveal assumptions and worldviews, and the tools to mediate differences between contesting value systems. And worse still, sustainability talk can lead us in the direction of Orwell’s (1989) famously satirical notion of “doublethink” whereby ordinary citizens can increasingly hold in their minds contradictory meanings for the same term and accept them both (Orwell, 1989, p. 223). The power of universal discourse in reducing meaning to a minimum is such that, as in “1984”, antagonistic concepts can be conjoined in a single phrase (“war is peace”, “peace is war”) or concept (i.e. “sustainable growth”) (Jickling, 2001). Big Brother’s “Newspeak” was designated not to extend but to diminish the range of thought, and this purpose was indirectly assisted by cutting down the choice of words to a minimum (Orwell, 1989, p. 313). In Newspeak concepts capable of opposing, contradicting or transcending the status quo were liquidated. As a result of this devaluation of language the people in “1984” found themselves in a state of linguistic dysfunction which was exactly what Big Brother wanted (Jickling, 2001). Seen this way sustainability tends to blur the very distinctions required to evaluate an issue thoughtfully. When comparing the sustaining of ecological processes with the sustaining of consumerism we immediately see inconsistencies and incompatibilities of values, yet many people, conditioned to think that sustainability is inherently good, will promote both at the same time.

Talking about sustainability is quite different from making it the end, or aim, of education, or using it as the pre-eminent organizing concept. Unfortunately, the mantra of sustainability has conditioned many to believe that this term carries unconditional or positive values. Yet environmental issues are not fundamentally or exclusively about sustainability. Rather, they are issues about cultural identities, social and environmental equity, respect, society–nature relationships and tensions between intrinsic and instrumental values. Ameliorating issues of sustainability involves addressing ethical questions, for instance, regarding the injustice in sharing the use of the world’s resources. We do not know the answers to these questions and should not pretend that we do, but we do know that they cannot be found without also looking at issues of; development, justice, peace and conflict, human rights and dignity, and intrinsic value of other species, and indeed, whole ecosystems. Students must be in the position to examine critiques of scientism and technical rationality, and related life styles. If our universities and colleges do not facilitate this then they basically fail to involve them

in one of the biggest political challenges of our time. Nobody has a single right vision of what a ‘good’ lifestyle entails. Nobody yet knows how to best sustain the earth’s ecosystems for the benefit of ourselves, our children, and also for other forms of life—the more-than-human-world. It is a myth to think that there is a single right vision or a best way to sustain the earth or what kind of earth should be sustained. Underlying the shallow consensus that appears to be triggered by the introduction of sustainability, there are still norms, values and interests that are in conflict. At the same time this shallow consensus itself can also serve specific prevailing norms, values and interests.

2. Utilitarian and emancipatory views of (higher) education

In an essay entitled “The Role of Higher Education in Achieving a Sustainable Society” (President’s Council on Sustainable Development, 1995, p. 5), Tony Cortese states that ‘...[institutions for higher education] have the unique freedom to develop new ideas, comment on society, and engage in bold experiments, as well as to contribute to the creation of new knowledge’. Universities in particular have a role in developing in their students the so-called dynamic qualities (Posch, 1991) that allow them to critique, construct and act with a high degree of autonomy and self-determination, if not in their personal lives then at least in their professional lives. At the same time universities should develop in their students the competencies which will enable them to cope with uncertainty, poorly defined situations and conflicting or at least diverging norms, values, interests and reality constructions. Posch writes in an OECD-ENSI publication: “Professional, public and private life have become increasingly complex, with divergent and even contradictory demands on the individual [who lives] within an increasingly pluralistic value system. Above all, it is necessary to look beyond everyday normalities and to search for ethically acceptable options for responsible action” (Posch, 1991, p. 12). This is one of the things that sets higher education apart from training and conditioning and makes the prescription of particular lifestyles or (codes of) behavior problematic as it stifles creativity, homogenizes thinking, narrows choices and limits autonomous thinking and degrees of self-determination.

With this above in mind an instrumental interpretation of “education for sustainability” or “sustainable development” becomes problematic. In such an interpretation, education is to contribute to the creation of a (more?) sustainable world—what ever such a world may look like. Education, higher education included, is one means or instrument that governments can use to create a sustainable world as they (and the interest groups influencing governments) define it. The problem is that we do not really know what the right sustainable way of living is. Even if we would, it would vary greatly from situation to situation and likely to change over time as circumstances continuously change. To educate *for* sustainability is not necessarily educational when sustainability is fixed, pre- and expert determined (i.e. academics) and to be re-produced by novices (i.e. students). We could also take on a more emancipatory approach to relationships between education and sustainability. Such a view would hold that education is to contribute to the creation of a (more?) democratic and environmentally just world—whatever such

a world may look like. Education is viewed as a means to become self-actualized members of society, looking for meaning, developing their own potential and jointly creating solutions. In this view a sustainable world cannot be created without the full and democratic involvement of all members of society; a sustainable world without participation and democracy is unthinkable. If we juxtapose more instrumental views of “education for sustainability” with more emancipatory views of “education for sustainability” we can imagine, on the one hand, an ‘eco-totalitarian’ regime that through law and order, rewards and punishment, and conditioning of behavior can create a society that is quite sustainable according to some more ecological criteria. Of course, we can wonder whether the people living within such an ‘eco-totalitarian’ regime are happy or whether their regime is just, but they do live ‘sustainably’ and so will their children. We might also wonder if this is the only, or best, conceptualization of sustainability. On the emancipatory end of the continuum we can imagine a very transparent society, with action competent citizens, who actively and critically participate in problem solving and decision making, and value and respect alternative ways of thinking, valuing and doing. This society may not be so sustainable from a strictly ecological point of view as represented by the eco-totalitarian society but the people might be happier, and ultimately capable of better responding to emerging environmental issues.

These notions about democracy and participation can also be applied to processes for making decisions about the content and direction of the learning taking place in our colleges and universities. To what extent are learners and facilitators of learning involved in such decisions? To what extent does higher education respond to the challenges identified by the community? To what extent is the learning process and content sensitive to the ideas, values, interests and concepts embodied by the learners themselves? These are some questions that need to be answered when trying to link a concern for the environment to a concern for democracy within an educational framework. Fig. 1 represents an attempt to position different conceptualizations of education within the force-fields described so far.

If the integration of sustainability in higher education is closely connected to the development of emancipatory qualities it will need to provide students with a way of understanding and transforming the complex world of which they are part. However, it is typically assumed that the state is the key agent of educational regulation, and that regulatory networks should be created to monitor people’s behavior. The 1990s still represented an era in which the restructuring of (environmental) education took place in conservative ways. This era largely left socially reproductive processes and exploitative economic practices unquestioned, thereby in essence strengthening them. The development of rather positivistic and deterministic standards and outcomes for education, environmental education and education for sustainability fits well in this tradition.

Despite the cautions we raise with regards to rallying behind “sustainability” as an organizing theme for higher education, we do see tremendous educational potential which can and should be tapped by institutes of higher education. In the next two sections we will look at this potential and will look at ways to think about standards for the integration of sustainability in higher education in ways that do not standardize realities.

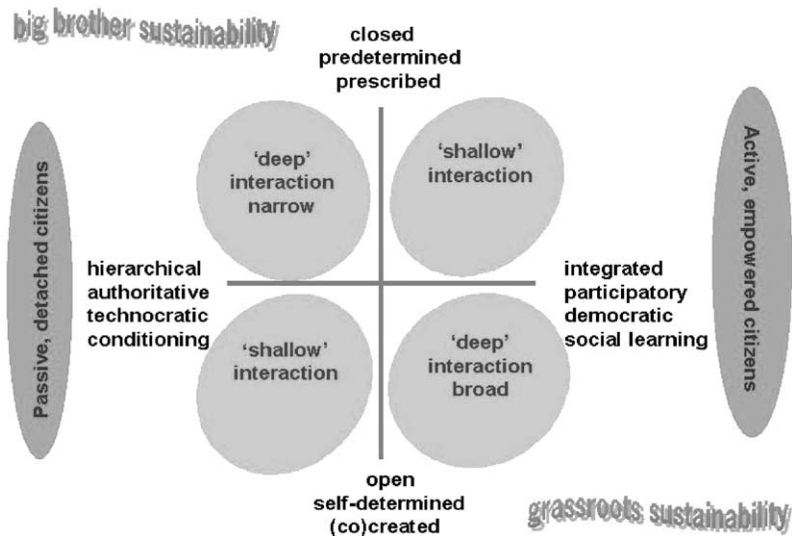


Fig. 1. Positioning sustainability in higher education in two force-fields.

3. The educational potential of sustainability in higher education

Now that we have reflected on the ill-defined nature of sustainability and the merits of taking a more participatory, democratic, pluralistic, and emancipatory approach to education and sustainability, we are better able to outline some possible implications of integrating sustainability in higher education. In presenting this outline we will make use of seven lessons learnt from an earlier project focusing on the integration of sustainability into higher education (Van den Bor, Holen, Wals, & Filho, 2000):¹

1. *Integrating sustainability pre-supposes the re-thinking of institutional missions:* The integration of sustainability will never lead to anything fundamentally new if the institution is not prepared to re-think its academic mission (see also: Filho, 1999). This mission debate should involve all actor groups in the university. It should lead to the re-formulation of the aims and objectives of teaching and research programmes and it should result in a commonly accepted strategy at the macro-, meso- and micro-level. Only then mission statements can become more than a public relations tool.

2. *It is no use crying over vague definitions:* The ambivalent nature of the concept of sustainability can be a major conceptual impediment to those who like to work with crisp and clear, narrowly defined concepts: 'Tell me what it is and I'll teach it!' It should also be realized, however, that this vagueness has an enormous canvassing and heuristic capacity if it is systematically and systemically used as a starting point or op-

¹ We wish to acknowledge the input of Wout Van den Bor and Peter Holen who have been instrumental in distilling the lessons learnt from various AFANet activities that took place within the topic 'Integrating Sustainability in Higher Agricultural Education'. These lessons learnt can also be found in Van den Bor, Holen, and Wals (2000).

erational device to exchange views and ideas. These ongoing discussions may generate fruitful working hypotheses for the concrete formulation of curricula, study programs, subject matter content and didactical arrangements. Sustainability has many faces and features which greatly enhance its educational potential from a more emancipatory perspective. These faces include:

- Sustainability as (socially constructed) *reality* (and as such a phenomenon to be taken seriously).
- Sustainability as *ideology* and therefore *political*.
- Sustainability as *negotiated*, the result of (on-going) negotiations.
- Sustainability as *contextual*, its meaning is dependent on the situation in which it is used.
- Sustainability as *vision* to work towards.
- Sustainability as *dynamic* and/or *evolving* concept.
- Sustainability as controversial and the source of *conflict* (both internal and with others).
- Sustainability as *normative, ethical* and *moral*.
- Sustainability as *innovation* or a *catalyst* for change.
- Sustainability as a *heuristic, a tool-to-aid thinking*.
- Sustainability as a (temporary) *stepping stone* in the evolution of environmental education and of environmental thought.

3. *Sustainability is as complex as life itself*: The concept of sustainability is related to the social, economic, cultural, ethical and spiritual domain of our existence. It differs over time and space and it can be discussed at different levels of aggregation and viewed through different windows. Hence, a curricular review in terms of sustainability integration is per definition of an interdisciplinary, systemic and holistic nature. It concerns cognition, attitudes, emotions and skills. It does not lend itself to unilateral, linear planning or a reductionist scientific paradigm and thus involves the systemic integration between theory and practice into systemic praxis.

4. *Teaching about sustainability requires the transformation of mental models*: Teaching about sustainability presupposes that those who teach consider themselves learners as well and that students and other concerned groups of interest are considered as repositories of knowledge and feelings too. Teaching about sustainability includes deep debate about normative, ethical and spiritual convictions and directly relates to questions about the destination of humankind and human responsibility. In this way it differs from a modernist and positivistic way of thinking. It incorporates notions of the possibility of the finiteness of human existence and trust in human creativity at the same time.

5. *There is no universal remedy for programmatic reconstruction*: The inclusion of aspects of sustainability in academic programmes is very much culturally defined. Also it is closely tied to the academic history and curricular tradition of the institution concerned. Consequently, there is no *panacea* for curricular reform. Some institutions will choose to add on to existing programmes, others will opt for a more revolutionary approach. The decision about the most desirable reform approach is time and space

specific and can only be taken in an open and communicative process in which all actor groups play their own, respected roles.

6. *Sustainability in programming demands serious didactical re-orientation*: Based on the 2000 Krakow seminar on the integration of sustainability in higher (agricultural) education (Wagner & Dobrowolski, 2000) the following requirements, all pointing at the need for a didactical re-orientation, can be synthesized:

- Sustainability requires a focus on *competencies* and *higher thinking skills*.
- Sustainability requires a foundational appreciation of *holistic principles*, *critical system understandings*, and *practical systemic competencies*.
- Sustainability requires an *early start*, i.e. well before students enrol in universities (from kindergarten through high school).
- Sustainability requires *critical reflection* on one's own teaching.
- Sustainability requires *self-commitment* and *taking responsibility*.
- Sustainability requires *empowerment* of learners by enabling them to work on the resolution of *real issues* that they themselves have identified.
- Sustainability requires appreciation and *respect for differences*.
- Sustainability requires *courage* ('Dare to be different').
- Sustainability requires *creativity* as there are no recipes.

Integrating aspects of sustainability cannot be realized without thinking very critically about the re-structuring of didactical arrangements. This re-orientation requires ample opportunity for staff members and students to embark on new ways of teaching and learning. For this to happen they have to be given the opportunity to re-learn their way of teaching and learning and to re-think and to re-shape their mutual relationships. These new didactical arrangements pre-suppose a problem orientation, experiential learning and lifelong learning. The following shifts in educational orientation appear to make sense in this regard:

- from consumptive learning to discovery learning and creative problem solving;
- from teacher-centered to learner-centered arrangements;
- from individual learning to collaborative learning;
- from-theory dominated learning to praxis-oriented learning;
- from sheer knowledge accumulation to problematic issue orientation;
- from content-oriented learning to self-regulative learning;
- from institutional staff-based learning to learning with and from outsiders;
- from low level cognitive learning to higher level cognitive learning;
- from emphasizing only cognitive objectives to also emphasizing affective and skill-related objectives.

7. *Sustainability is not "Holy"*: Sustainability is particularly useful when it is seen as a stepping stone for teaching and learning which over time can become obsolete or replaced by another heuristic. When it becomes an organizing principle or a pre-determined end of education it may well stifle creativity or hinder critical thinking or, worse yet, become un-educational.

Focussing on sustainability provides an opportunity for accessing higher learning (epistemic development) and new ways of knowing (the paradigmatic challenge), precisely because the concept is (a) so slippery and open to different interpretations and (b) so potentially complex (involving ethical, moral, aesthetic and spiritual issues as well as the more conventional technical, economic, social and cultural ones). In other words, serious attempts to integrate sustainability into higher education brings academics into whole new pedagogical worlds—experiential, epistemic, and systemic—which in turn brings them into whole new worlds of learning and, indeed, researching (Bawden & Wals, 2000). Viewed as such sustainability is an ideal entrée into epistemology, ontology and ethics, and indeed can be quite educational.

4. Conclusion

As educators with broad concerns about the future of the earth, and concerns about the multiple aspects of human/society/nature relationships we must seek more, not less diversity of thought. And, this will be best achieved when we use less exclusive language to describe ourselves and our educational activities. This observation has far reaching implications for the goals, content and process of higher education in general, and for the position and meaning of sustainability in higher education, in particular. For instance for the way we look at setting standards for sustainability in higher education. The process of seeking, rather than setting, standards for education for sustainability, from an emancipatory vantage point, above all means the creation of space. Space for alternative paths of development. Space for new ways of thinking, valuing and doing. Space for participation minimally distorted by power relations. Space for pluralism, diversity and minority perspectives. Space for deep consensus, but also for respectful *dissensus*. Space for autonomous and deviant thinking. Space for self-determination. And, finally, space for contextual differences and space for allowing the life world of the learner to enter the educational process (see also Wals, Alblas, & Margadant-Van Arcken, 1999). If, on the other hand, standards are there to compare, prescribe, assess and judge, then there is a need for a clear definition of things like sustainability, sustainable practice, a sustainable future and the path that takes us there. If standards are there to encourage excellence, diversity, self-determination and openness towards the future, then looking for universal definitions of sustainability, necessary conditions for sustainability, essential knowledge claims about sustainability and prescribing sustainable futures, becomes undesirable and, indeed, uneducational.

Walker, Thomas, and Wals (in press) believe that embedding sustainability across all the functions of a university offers the potential for a university to make a significant contribution to environmental improvement. The fact that ‘sustainability’ is a messy, ill-defined concept gives universities the opportunity to grapple with the concept and develop new ways of thinking about the concept. Sustainability provides colleges and universities an opportunity to confront their core values, their practices, their entrenched pedagogies, the way they program for student learning, the way they think about resources and allocate these resources and their relationships with the broader community.

When Rachel Carson wrote *Silent Spring*, no one had heard of deep ecology. When Naess coined the term deep-ecology, nobody had heard of the term sustainable development. When sustainable development became popular (WCED, 1987), eco-feminism was virtually unknown and in its infancy. In other words, we have no idea where we might go next. Higher education has first and foremost something to do with creating possibilities, not defining or prescribing the future for our students. These possibilities arise when universities promote the exploration, evaluation, and critique of emerging ideas and the creative contribution to their development. Viewed as such sustainability is best seen as only one of many stepping stones.

References

- Bawden, R., & Wals, A. E. J. (2000). Conceptualising sustainability in education for agriculture and rural development. *Polish Journal of Environmental Studies*, 9(2), 13–20.
- Berryman, T. (1999). Relieving modern day atlas of an illusory burden: Abandoning the hypermodern fantasy of an education to manage the globe. *Canadian Journal of Environmental Education*, 4, 50–68.
- Canadian Journal of Environmental Education (1999). *Special issue on environmental education in a postmodern world*, Vol. 4.
- Dreyfus, A., Wals, A. E. J., & van Weelie (1999). Biodiversity as a postmodern theme for environmental education. *Canadian Journal of Environmental Education*, 4, 155–176.
- Filho, W. L. (Ed.) (1999). *Sustainability and university life: Environmental education, communication and sustainability*. Berlin: Peter Lang Verlag.
- González-Gaudiano, É. (1999). Environmental education and sustainable consumption: The case of Mexico. *Canadian Journal of Environmental Education*, 4, 176–192.
- Gough, S., & Scott, W. (1999). Education and training for sustainable tourism: Problems, possibilities and cautious first steps. *Canadian Journal of Environmental Education*, 4, 193–212.
- Hesselink, F., van Kempen, P. P., & Wals, A. E. J. (2000). *ESDebate: International on-line debate on education for sustainable development*. Switzerland: IUCN, Gland.
- Huckle, J. (1999). Locating environmental education between modern capitalism and postmodern socialism: A reply to Lucie Sauv . *Canadian Journal of Environmental Education*, 4, 36–45.
- Jarret, A., Jickling, B., Sauv , L., Wals, A. E. J., & Clarkin, P. (Eds.) (2000). *The future of environmental education in a postmodern world?* Whitehorse, Canada: Yukon College.
- Jickling, B. (1999). Beyond sustainability: Should we expect more from education? *Southern African Journal of Environmental Education*.
- Jickling, B. (2001). Environmental thought, the language of sustainability, and digital watches. *Environmental Education Research*, 7(2), 167–180.
- Orwell, G. (1989). *Nineteen eighty-four*. London: Penguin Books. (First published in 1949)
- Posch, P. (1991). Environment and school initiatives. In: *Environment, schools and active learning*. Paris: OECD.
- President's Council on Sustainable Development (1995). Public linkage, dialogue and education task force. *Workshop on the principles of sustainability in higher education*. Medford, MA: Second Nature Publications.
- Sauv , L. (1996). Environmental education and sustainable development: Further appraisal. *Canadian Journal of Environmental Education*, 1(1), 56–89.
- Sauv , L. (1999). Environmental education between modernity and postmodernity. *Canadian Journal of Environmental Education*, 4, 9–36.
- Smyth, J. (1999). Is there a future for education consistent with Agenda 21? *Canadian Journal of Environmental Education*, 4, 69–82.
- UNCED (United Nations Conference on Environment and Development) (1992). *Agenda 21, the United Nations Programme of Action from Rio*. New York: UN Department of Public Information.

- Van den Bor, W., Holen, P., & Wals, A. E. J. (2000). Sustainability in higher (agricultural) education: A synthesis. In: W. Van den Bor, P. Holen, A. E. J. Wals, & W. Filho (Eds.) *Integrating concepts of sustainability into education for agriculture and rural development* (pp. 305–317). Frankfurt: Peter Lang Publishers.
- Van den Bor, W., Holen, P., Wals, A. E. J., & Filho, W. (Eds.) (2000). *Integrating concepts of sustainability into education for agriculture and rural development*. Frankfurt: Peter Lang Publishers.
- Wagner, A., & Dobrowolski, J. W. (Eds.) (2000). *International conference on holistic concepts of training for the promotion of sustainable development focused on European integration for better quality of environment and human life*. Book of Summaries. Krakow: University of Mining and Metallurgy.
- Walker, K., Thomas, I., & Wals, A. E. J. (submitted). Sustainability as innovation: Changing higher education in two Australian Universities, *Journal of Sustainability in Higher Education*, submitted.
- Wals, A. E. J., Alblas, A. H., & Margadant-Van Arcken, M. (1999). Environmental education for human development. In: A. E. J. Wals (Ed.). *Environmental education and biodiversity*. National Reference Centre for Nature Management, Wageningen.
- Weston, A. (1992). Before environmental ethics. *Environmental Ethics*, 14(4), 321–338.
- Weston, A. (1996a). Self validating reduction: Towards a theory of environmental devaluation. *Environmental Ethics*, 18(2), 115–132.
- Weston, A. (1996b). De-schooling environmental education. *Canadian Journal of Environmental Education*, 1, 35–46.
- World Commission on Environment and Development (1987). *Our common future*. Oxford: Oxford University Press.

Arjen E.J. Wals is an Associate Professor in Environmental Education at the Communication & Innovation Studies Group of the Wageningen University. Research interests include action research and community problem solving as a means to link social and environmental change, tackling ill-definedness in environmental education, and the greening of higher education.

Bob Jickling is an Instructor at Yukon College in Whitehouse in the Yukon Territory of Canada, and is editor of the *Canadian Journal of Environmental Education*. Research interests include conceptualizing environmental education, environmental ethics, and relationships among environment, ethics, and education.