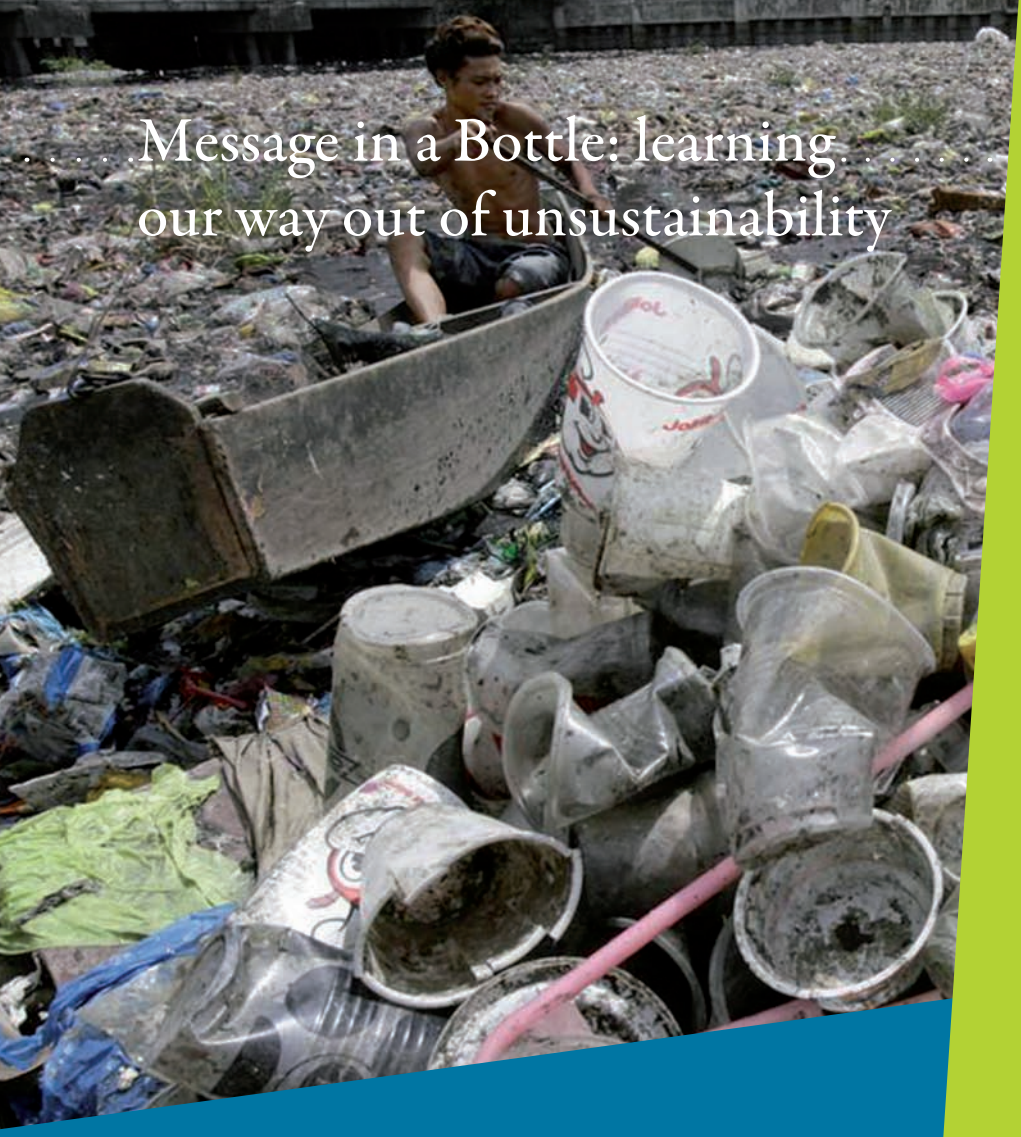


Message in a Bottle: learning our way out of unsustainability

Prof. dr. ir. Arjen E. J. Wals

Inaugural lecture upon taking up the posts of Professor of Social Learning and Sustainable Development, and UNESCO Chair at Wageningen University on May 27th 2010

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Mr. McGuire: *I just want to say one word to you - just one word.*
Ben: *Yes sir.*
Mr. McGuire: *Are you listening?*
Ben: *Yes I am.*
Mr. McGuire: *'Plastics.'*
Ben: *Exactly how do you mean?*
Mr. McGuire: *There's a great future in plastics. Think about it. Will you think about it?*
Ben: *Yes I will.*
Mr. McGuire: *Shh! Enough said. That's a deal.*

(The Graduate, 1967 - www.youtube.com/watch?v=PSxihhBzCjk)

In today's world, life without plastics is incomprehensible. Every day, plastics contribute to our health, safety and peace of mind (Source: American Chemistry Council 2010. www.americanchemistry.com/s_plastics/doc.asp?CID=1102&DID=4665)

One hundred million bottles washed upon the shore

I would like to start this inaugural address by introducing a recently discovered Island somewhere in the Pacific Ocean. I had heard about the Island but wasn't sure whether it was mythical or real. So a few months ago I decided to do what most people, including scientists, do I googled the name of the island: 'plastic island'. The search yielded no less than 286.000 hits the first one of which was *www. plasticisland.org*, followed shortly thereafter by wiki-pedia, of course, which stated that: *The Great Pacific Garbage Patch* [another name for this island] *is characterized by exceptionally high concentrations of plastics, chemical sludge, and other debris that have been trapped by the currents of the North Pacific Ocean*. Despite its

size and density, this patch – which roughly is twice the size of Texas or 34 times the size of the Netherlands – is not visible from satellite photography since it primarily consists of suspended particulate in the upper water column. Since plastics break down to ever smaller polymers, concentrated particulate is not visible from space nor does it appear as a continuous debris field. Instead, the patch is defined as an area in which the mass of plastic debris in the upper water column is significantly higher than average. Although there are no exact measurements available an estimated 100 million tons of mostly plastic garbage is circulating in this part of the North Pacific, and there are other islands like this in other parts of the ocean as well. An estimated 80% of the garbage originates on land, while the remaining 20% comes from ships, most notably from passenger cruise ships.

The plastic parts vary in size from clearly visible to microscopically small. The bigger parts like bottle caps or cigarette lighters can be found in the stomachs of young albatross living on the near by atolls. They have been fed these plastics by their parents who see them floating in the water and pick them up thinking they are food items. The smaller parts also make their way to the stomachs of fish and are spreading through out the ocean. Some scientists are already referring to the world's ocean as one giant toxic soup. They have shown in lab experiments that toxic components of plastic can leech into the water. This finding raises into doubt earlier claims that it takes 500 to 1000 years to decompose. To claim that you can still catch and eat an 'organic wild salmon' is an illusion says Charles Moore as there is no fish to be found in the ocean anymore that does not have trace elements of plastics in its system. Moore of the Algalita Marine Research Foundation, the man who discovered the garbage island in 1997, is not so convinced that plastics breakdown more rapidly than previously thought as he believes that in most cases plastics sink to greater depths in the ocean to places where there is no light and temperatures are very low which slows down decomposition processes significantly. Nonetheless he too states that: *"...regardless of whether its chemicals leach into the water, the sheer volume of plastic floating in the sea makes it a major polluter. Discarded plastic junk makes its way from gutters and storm drains into rivers and streams, and eventually flows into the ocean, where it gets trapped by currents and creates vast regions of plastic soup.... Even if polystyrene isn't decomposing in the water... it could be breaking down in the digestive tracts of fish and marine mammals...*

"Every size of organism, every creature in the food web in the ocean, from the smallest filter feeders to the largest whales, is consuming plastic." (source: www.algalita.org).

In his book 'Running the numbers: An American Self-Portrait' (Jordan, 2009) American photographer Chris Jordan uses photography to make incomprehensible statistics visible. A picture shows two million plastic bottles, the number of bottles used in the United States every five minutes (Figure 1). Another one shows 426.000 cell phones, the number of cell phones discarded in the US everyday. On his website (www.chrisjordan.com) he writes:



Figure 1. Front cover of 'Running the Numbers' an artistic attempt by photographer Chris Jordan to make mind boggling environmental statistics more visible and meaningful (Source: www.chrisjordan.com)

The pervasiveness of our consumerism holds a seductive kind of mob mentality. Collectively we are committing a vast and unsustainable act of taking, but we each are anonymous and no one is in charge or accountable for the consequences. I fear that in this process we are doing irreparable harm to our planet and to our individual spirits.

As an American consumer myself, I am in no position to finger wag; but I do know that when we reflect on a difficult question in the absence of an answer, our attention can turn inward, and in that space may exist the possibility of some evolution of thought or action. So my hope is that these photographs can serve as portals to a kind of cultural self-inquiry. It may not be the most comfortable terrain, but I have heard it said that in risking self-awareness, at least we know that we are awake (source: www.chrisjordan.com).

The plastics Mr. McGuire offered the graduate Ben as a promising future have over time become a metaphor for the so-called 'throw-away society' characterized by unbridled materialism and consumerism. The plastic island and the work of Chris Jordan represent powerful imagery that raises our consciousness about what some refer to as a systemic crisis in the way we live on this planet. The island and Jordan's work are both real and symbolic: they refer to symptoms of something much deeper, but even the symptoms have become all encompassing global phenomena affecting people and other species everywhere. The hundreds of millions plastic bottles washed up on the shore and spiraling in the Gyre contain important messages, just like many other warning signals such as: the increased frequency of un-natural disasters related to shifting weather patterns, rapid decline of biodiversity, and so on.

The story of plastic in a sense captures the urgency, systemic nature, magnitude, uncertainty, ambiguity, complexity as well as the moral and ethical underpinnings of the sustainability challenge. It also illustrates that in an era of google, youtube and twitter information is coming to citizens, particularly the younger generations hooked on ICT, around the world very rapidly in great volumes and very graphically. At the same time it raises questions about the role of science and education as there is no longer, if there ever was, a single knowledge authority or truth.

Doom and gloom 2.0

Of course this is not the first era of doom and gloom or period of human caused catastrophic events. In his book 'Collapse' Jared Diamond (Diamond, 2005) demonstrates how unsustainable living will, in fact, lead to a society's downfall and

eventually to total collapse (Figure 2). He identifies a number of reasons why a society may fail, but living beyond its ecological and technological means he considers the most important one. Examples Diamond uses include Easter Island, the Mayan Civilization, and the Anasazi: three societies that completely vanished after having enjoyed times of tremendous prosperity.

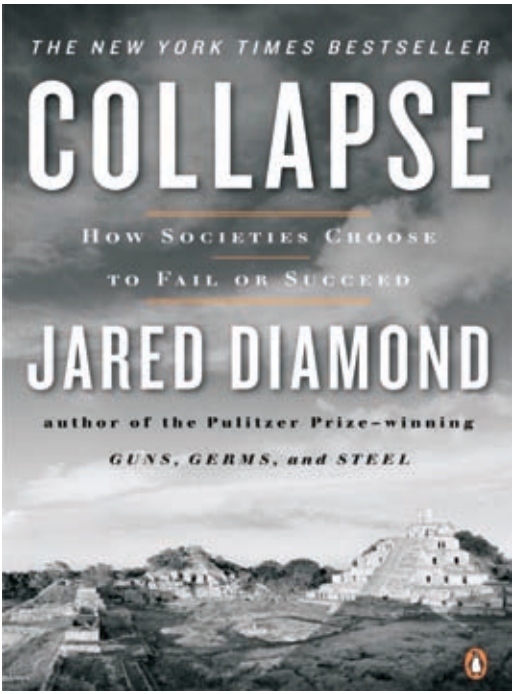


Figure 2. Cover page of Jared Diamond's book 'Collapse,' an account of past societies vanishing at their height of civilization as a result of living beyond their ecological and technological means

More recently, about a century ago, concerned citizens in industrializing and urbanizing countries began to act on their concern regarding the rapid loss of nature. In The Netherlands - through early forms of environmental activism - a

small group of them succeeded in keeping one of the lakes and wetland areas near Amsterdam – het Naardermeer (Figure 3) – from becoming a dumpsite for Amsterdam's household waste. This success is often referred to as a landmark event in the start of the Dutch Nature Conservation movement. Organizations like Natuurmonumenten were formed whose mission it was – and still is – to protect nature (often times by buying up land and keeping it from being developed) but also to promote ecological and environmental awareness and to create a strong societal support base for nature conservation through education (of school children and visitors), training (of guides and interpreters) and public campaigning. Similar movements and strategies emerged in other parts of the world as well.



Figure 3. Front cover of 'Het Naardermeer,' a picture collection album which Jac. P. Thijsse created in 1912 to raise awareness about a lake and wetland area near Amsterdam (Source: Heimans en Thijsse Stichting – www.heimansenthijssestichting.nl)

About half a century ago – indeed when plastics became an integral part of our everyday life and modern industrialization allowed for mass consumption and mass production – the nature conservation movement was accompanied by an environmental movement. Highly influential works such as Rachel Carson's Silent Spring (Carson, 1962) and the Report of the Club of Rome 'Limits to Growth', as well as international meetings such as the United Nations meeting on the Human Environment held in Stockholm in 1972 (UN, 1972), combined with the tangible evidence of the consequences of environmental pollution (toxic lakes, acid rain, airborne lung diseases, etc.), triggered a wave of environmentalism and environmental activism. This environmental tsunami resulted not only in much needed environmental legislation, but also in the birth of environmental education that focused on changing people's environmental behavior (e.g., waste reduction, recycling and energy efficiency). New organizations were formed that had a strong environmental focus and considered environmental education, communication and advocacy to be important components of their mission. Environmental concern was high and much enhanced by lots of media attention and the powerful television images of smoke stacks, dead fish, Chernobyl, acid rain affected trees, Bhopal and Greenpeace activism entering households almost on a daily basis.
More recently – arguably since the Earth Summit in Rio de Janeiro in 1992 – it has become clear and more widely accepted that environmental issues not only transcend the environmental and the ecological to encompass the social, economic and cultural, but also the local and the regional to include the global. Issues like human-triggered climate change or – as David Selby refers to it: runaway climate change (Kagawa & Selby, 2009) - make painfully clear that the present major environmental, social, financial, economic and ecological disruptions (both acute and chronic) are interconnected and characterized by high levels of uncertainty and complexity. We live in a 'systemic world' characterized by multiple causation, interactions, complex feedback loops and the inevitable uncertainty, and unpredictability. Old mechanisms, coordination points, problem solving strategies, modes of scientific inquiry and forms of teaching and learning, seem inadequate in addressing the present global sustainability challenge. After all, dominant structures in, for instance, governance, policy-making, science and education, are still essentially based on fragmentation and management and control thinking rather than on connectivity and chaos and complexity thinking.

At the same time prevailing growth dependent economic systems and the material lifestyles needed to support them do not seem to offer a solution to existential threats such as; the depletion of natural resources, the rise of unnatural disasters, human-induced climate change, marine toxicity, and rising inequity. On the contrary: they are increasingly seen as a part of the problem and not as a part of the solution. Instead, solutions appear to require more systemic and reflexive ways of thinking and the development of alternative systems, lifestyles and values that, at least for now, promise to be more sustainable than the ones they seek to replace.

Education and learning

Over time a whole range of instruments and mechanisms has evolved to address the undesired side effects of un-sustainability, particularly those who were easily and immediately observable. These instruments and mechanism include: socio-technological innovations, legislation, policies, fiscal policy and economic incentives and social marketing. In addition, alongside and occasionally in connection, communication, education and learning have always played a role in finding a response to the loss of nature, environmental degradation, natural resource depletion and, indeed, the current sustainability crisis. The significance of these learning-based instruments has varied though from country to country but also within countries over time, and some scholars argue that most education, communication and learning in industrial and post-modern times has accelerated un-sustainability and the loss of nature as they argue that they primarily have been serving economic ends at the expense of other more fundamental ones (Orr, 2003; Senge, 2010). Nevertheless, however marginal, over the last one hundred years or so one could say that there has been an evolution from nature conservation education to environmental education to education for sustainability. Although many will argue that environmental education, when interpreted in the spirit of Tbilisi (UNESCO, 1978) essentially is about sustainability. I will briefly touch upon all three of them.

Nature conservation education

The nature conservation movement, referred to earlier, led to the birth of nature conservation education and the development of what might be called ecological literacy. In the Netherlands we might refer to the first city farms or children's farms and so-called school gardens in inner-cities, which were created in cities like The

Hague, Rotterdam and Amsterdam well over 50 years ago. Re-connecting citizens, children in particular with nature and the sources of their food, getting them into the outdoors, were some of the main objectives. Parallel to this, visitor centers and environmental education in state parks were created to provide forms of edu-tainement (forms of education that are not perceived as such by the learner) that made discovering and understanding the natural world both enjoyable and educational. Schools paid attention to nature in the school curriculum and occasionally would take children on an excursion to a local nature preserve or a local farm.



Figure 4. Dutch primary school children learning about animals at a local city farm

Much of this is still going on today, and is even getting renewed attention, and not just here in this country. Understanding and discovering nature, the web-of-life, and how we affect nature and how nature affects us, generally form the desired learning outcomes of all these activities. Although the level of government support has fluctuated over time, nature (conservation) education remains in place today.

Environmental education

In North America, Bill Stapp's 1969 article on 'the concept of environmental education' in the first volume of the Journal of Environmental Education is often referred to as the starting point of environmental education (Stapp, 1969). It is with some pleasure and joy that I refer to Bill Stapp. After all it was the late Bill Stapp who in many ways provided a launching pad for my own academic career as he was my mentor and PhD supervisor at the University of Michigan in the late eighties and early nineties. More importantly, he was a visionary who as one of the co-Chairs of the landmark Tbilisi conference (UNESCO, 1978) and as UNESCO's first Director of Environmental Education (EE), made clear, almost forty years ago, that environment, economy, ecology, ethics and equity are all connected. His interpretation of EE closely matches commonly held meanings of education and learning in the context of sustainability today. EE nowadays appears firmly rooted in the educational policies of a variety of governments in the North and the South which call for, among other things, the integration of environmental education in the formal education system.

Learning for sustainability/Education for Sustainable Development (ESD)

Learning for sustainability or the more internationally used ESD, is not so much rooted in local contexts and traditions, but can rather be seen as a result of international policy agreements and new forms of governance that emphasize citizen involvement in visioning and decision-making. Arguably ESD has its roots in Earth Summits such as UNCED (Brazil, 1992) and UNCED plus 10 (South Africa, 2002) and international documents and support structures such as Agenda 21 (United Nations, 1992) and the current Decade of Education for Sustainable Development (DESD, 2005-2014). The history of this emerging field is thus far shorter than Nature Conservation Education and EE and spans just over a decade.

The current emphasis on sustainability, sustainable development and sustainable life support systems which recognizes the link between environmental and social equity, is leading to a shift from EE to education for sustainable development (ESD). This shift, not entirely without controversy, can be found in, for instance, the Thessaloniki declaration (UNESCO, 1997). Debates about this shift are on-going and have been documented in, for instance, almost an entire volume of the Canadian Journal of Environmental Education (CJEE, 1999), in the results of the on-line 'ESDebate' on education for sustainable development (Hesselink et. al, 2000), and more recently in the Mid-DESD review (UNESCO, 2009). There are different interpretations of ESD both in terms of content, educational process and in terms of how it relates to EE and indeed to other so-called adjectival educations such as health education, global education, development education, consumer education and so on. There are narrow and broad interpretations, just like we have seen in the past with interpretations of EE. When viewed broadly ESD stresses the link between the environmental and the socio-cultural, between the local and the global, the past-present and future, and the human and the non-human world. Narrow interpretations tend to emphasize the environmental and ecological dimension of SD. In terms of education process or the type of learning promoted, there are conventional interpretations focusing on expanding knowledge and understanding through classic forms of instruction (transmission-based) and more innovative ones that stress the importance of interaction, dialogue, reflection and moving beyond the cognitive (transformation-based). Again, similar patterns can be seen in the way EE has been interpreted over time along these two distinguishing features. Figure 5 shows that when both are interpreted broadly in terms of focus/content they become almost interchangeable, but when they are interpreted narrowly they do too. The same phenomenon can be observed when looking at the pedagogical dimension (Figure 6).

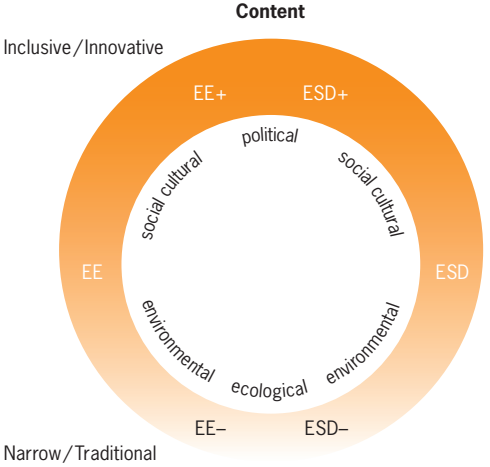


Figure 5. Different interpretations of ESD and EE and their relationship from a content perspective

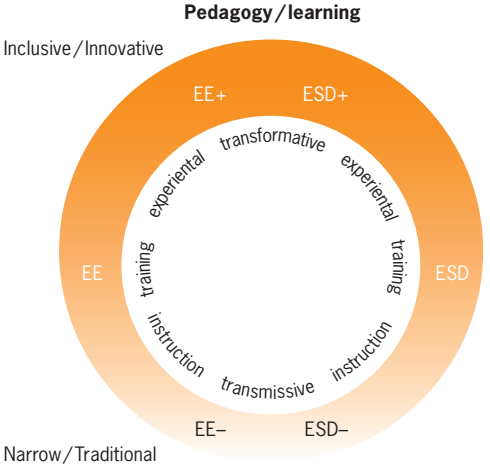


Figure 6. Different interpretations of ESD and EE and their relationship from a learning perspective

Change we can believe in and beliefs we can change

A critical question that is continuously asked in EE and ESD but in other educational fields as well is: what are or should we be changing or developing in learners? Or, alternatively, how can we create optimal conditions and support mechanisms which allow citizens, young and old, to develop themselves in the face of change? The first question has instrumental connotations, whereas the second one has emancipatory ones. The difference between the questions may appear small but, as we will see, speak to a large issue. When education in a range of settings, formal, informal and non-formal, is employed to somehow affect citizens young and old, we need to ask questions about the role of education in society. There is no consensus about this role. Two perspectives are particularly relevant here: the instrumental perspective and the emancipatory perspective. Both differ in the degree to which the learners have a say in what and how they learn but also in what they are learning for. On the one extreme education and learning is mostly expert driven (where there is a strong sense of what is 'right,' what needs to be done and a high degree of confidence and certainty in both the current knowledge base and the kind of behavior that is needed), while on the other extreme education and learning is mostly issue and process driven (where there is a strong sense of empowering, involving and engaging learners in issues that affect them and/or others, and less certainty about the current knowledge base and the kind of behavior that is needed).

In earlier writings my good friend and colleague Bob Jickling and I (Jickling and Wals, 2008; Wals and Jickling, 2002) referred to the instrumental perspective as one that could lead to 'big brother sustainability' or an 'eco-totalitarian regime' which may be very sustainable from an ecological/environmental perspective but in which people may not be very happy. Working within the emancipatory regime, on the other hand, may result in 'grassroots sustainability' consisting of communities of empowered, engaged and competent citizens that may be happier but may not reach solutions that are sustainable from an ecological/environmental perspective. One could argue that both perspectives are crucial but that one has to be careful using education as tool to influence human behavior in a particular direction as it contradicts the essence of education. There are other tools that might be more appropriate (i.e. legislation, regulation, economic incentives or deterrents, fiscal

policies but also overt persuasive communication and social marketing strategies) when adopting an instrumental perspective. One could also argue that the deeper the planetary sustainability crisis, the more tempting it will be to adopt more instrumental approaches as people, policy-makers and legislators included, will increasingly come to think that we are running out of time and need to act now. This might be a dangerous response because a flight to the instrumental might keep us from developing a more resilient society with a planetary conscience to which I will turn shortly. Before doing so allow me to go a little deeper into these two perspectives.

An instrumental perspective

Around the world environmental education has first and foremost gained importance because of its potential to contribute to the resolution of environmental issues and not because of its potential to contribute to democratic and emancipatory human development (Wals et al. 1999). It can be argued that the environmental justification of environmental education has, at least up until now, outweighed the pedagogical justification. Similarly this is the case in ESD although some would argue that the sustainability focus in ESD assumes that issues of democracy, equity and participation 'automatically' come into play.

Much environmental education around the world aims at changing learner behaviour that often is broadly defined to include attitudes, beliefs and values. Many environmental education researchers and practitioners are trying to instrumentally structure the content and process of environmental education by using hierarchical levels of universal goals and measurable objectives or learning outcomes (see for instance: Hungerford & Volk, 1990). It is no surprise that within environmental education that seeks to change 'learner behaviour', the establishment of knowledge and awareness of nature and environment, and the application of what is learned, are considered essential steps in the learning process. At the same time evaluation of to what extent these goals are reached is considered crucial for determining the success of environmental education and, incidentally, for justifying government spending on EE. Early EE was informed by insights from behaviorist socio-psychology that assumed a more or less linear causality between environmental awareness and environmental behavior (Fishbein and Azjen, 1980). In other

words: an increase in environmental awareness would lead to more responsible environmental behavior.

However, we have come to know for quite some time now that these models represent an oversimplification of reality and incorrectly assume a linear correlation between knowledge-awareness-behaviour (Hannigan, 1995). Just providing information, raising awareness and changing attitudes apparently is not enough to change people's behaviour. People's environmental behaviors are far too complex and contextual to be captured by a simple causal model. Glasser points out that even though people have a familiarity with a problems related to, what he calls, ecocultural unsustainability, they still choose not to respond or respond ineffectively (Glasser 2007). He points out that citizens can have different predispositions towards un-sustainability, including: (1) having no idea that a potentially serious problem exists; (2) honestly believing that a "problem" is a not a problem; (3) denying the existence of a problem by simply wishing it away or by ignoring the information (this includes *educated incapacity,* an acquired or learned inability to perceive a problem); (4) accepting the existence of a problem, but perceiving it as easily surmountable; (5) accepting the existence of a problem, but perceiving other problems or issues to take a higher priority; (6) failing to generate adequate support for action; and (7) taking action, but the chosen action proves to be inadequate, mismatched to the problem, or unsuccessful (Glasser 2007, p55). He calls for research that can help determine what learning levers might work best in overcoming these predispositions.

An emancipatory perspective

Besides questions about the relationship between knowledge, awareness and understanding of environmental issues and citizens' environmental behavior leading to some doubts about an instrumental focus of EE or ESD, for that matter, on these behavioral components, there are other concerns from the field of education. Educators, particularly those with a strong pedagogical background, challenge a focus of EE and ESD on behavioral change as they argue that education should above all be formative and focus on the kind of capacity building and critical thinking that will allow citizens to understand what is going on in society, to ask critical questions and to determine for themselves what needs to be done (Mayer

and Tschapka 2008; Jickling and Wals, 2008). The idea of influencing people's environmental behavior in a predetermined way, they maintain, contradicts the very foundation of education and borders on indoctrination. More recently this position is supported by the notion that there is much uncertainty with regards to what the right or best environmental or most sustainable behavior in fact is, and the recognition that there are no universal answers to this question and, finally, that insights and the knowledge base with regards to this question continuously shift in a post-modern and post-structural world (Wals, 2007).

If a key function of education is fostering autonomous thinking about, among other things, environmental issues then it would be contradictory to prescribe behavioral outcomes that a learning activity or sequence of activities needs to trigger. Jickling (1991), for example, wrote in his provocative 'Why I don't want my children to be educated for sustainable development?' article that he would not want his children to be educated *for* sustainable development, because it goes against the idea of education: 1) it suggests that education then becomes *training* which is the acquisition of skills and abilities which has instrumental connotations and can technically occur through repetition and practice without leading to a meaningful understanding, 2) the concept of sustainable development is contested, which makes teaching *for* it doubtful at least, and 3) the prescription of a particular outlook conflicts with the development of autonomous thinking. This does not necessarily mean that we should not educate *for* something. The issue here is: how do we go about teaching *for* something and who decides what we are for? For instance, in schools: Are teachers, students and other human resources in the community involved in deciding what is good for the community and the local environment or are those decisions made by outside experts? These are fundamental questions that need to be addressed. The same critics argue that environmental education and ESD should enhance a critical stance towards the world and oneself by promoting discourse, debate and reflection. It is through discourse that participants engage in a process of self-reflection on the relationship between their own guiding assumptions and interpretations and those of others.

From an emancipatory perspective education, EE and ESD inclusive, has a role in developing in people so-called dynamic qualities (Posch, 1991) that allow them to critique, construct and act with a high degree of autonomy and self-determination. At the same time good education also develops in people the competencies they need 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 has become increasingly complex, with divergent and even contradictory demands on the individual [who lives] within an increasingly pluralistic value system[1]. 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 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.

So in short, an instrumental approach assumes that a desired behavioral outcome of an environmental education activity is known, more or less agreed upon, and can be influenced by carefully designed interventions. An emancipatory approach, on the other hand, assumes that the dynamics in our current world are such that citizens need become engaged in an active dialogue to establish co-owned objectives, shared meanings, and a joint, self-determined plan of action to make changes they themselves consider desirable and of which the government hopes they, ultimately, contribute to a more sustainable society as a whole" (Wals & Jickling, 2002).

[1] When Posch wrote this in 1991 one could indeed see a move towards a pluralistic value system as a result of borders disappearing and and the increase in global mobility both virtual and real. However today, twenty years later, one could argue that economic globalisation and hyper connectivity is rapidly leading to the disappearance of non-material values at the expense of material values.



Figure 7. It's too much, but it is enough?
(Betsy Streeter, used with permission. www.betsystreeter.com)

Learning our way out

Is there a way out? Can the tide be turned? When the market fails and there are no invisible hands reaching out, where or who do we turn to? When over 600 billion dollar is spent annually on advertising, and over 100 million trees are cut annually for junk mail pushing products in the USA alone? When more than two million PET bottles are 'consumed' every five minutes everyday in the United States alone? When the drive to consume appears infinitely greater than the drive

to sustain? When individualism and materialism rapidly become the global norm? (Figure 7). When it becomes increasingly difficult to imagine a world without continuous economic growth? As pointed out already, environmental educators and environmental psychologists have long known that raising awareness about the seriousness of the state of the Planet is no assurance for a change in behavior or a change in values. In fact it has been shown that just raising knowledge and awareness without providing energizing visions and concrete practices that show that there are more sustainable alternatives, will lead to feelings of apathy and powerlessness (see for instance Kellsted *et al*., 2008 in relation to climate change). The nature of the sustainability crisis – characterized among other things by high levels of complexity and uncertainty – suggests that people will need to develop capacities and qualities that will allow them to contribute to alternative behaviors, lifestyles and systems both individually and collectively. This certainly ought to be the case in those parts of the world where people can worry about these things in relative comfort. For the billions who can no longer or never could in the first place, the struggle for survival and having basic needs met will always have priority. Until then their potential to contribute to a more sustainable world will likely remain untapped.

New forms of learning

In addition to much needed suitable forms of governance, legislation and regulation, we need to turn to alternative forms of education and learning that can help develop such the capacities and qualities individual, groups and communities need to meet the challenge of sustainability. There is a whole range of forms of learning emerging that all have promise in doing so: transdisciplinary learning, transformative learning, anticipatory learning, collaborative learning and, indeed, social learning are just a few of those. These forms of learning show a high family resemblance in that they:

- consider learning as more than merely knowledge-based,
- maintain that the quality of interaction with others and of the environment in which learning takes place as crucial,
- focus on existentially relevant or 'real' issues essential for engaging learners,
- view learning as inevitably transdisciplinary and even 'transperspectival' in that it cannot be captured by a single discipline or by any single perspective,

- regard indeterminacy a central feature of the learning process in that it is not and cannot be known exactly what will be learnt ahead of time and that learning goals are likely to shift as learning progresses,
- consider such learning as cross-boundary in nature in that it cannot be confined to the dominant structures and spaces that have shaped education for centuries.

The above characteristics make clear that the search for sustainability cannot be limited to classrooms, the corporate boardroom, a local environmental education center, a regional government authority, etc. Instead, learning in the context of sustainability requires 'hybridity' and synergy between multiple actors in society and the blurring of formal, non-formal and informal education. Opportunities for this type of learning expand with an increased permeability between units, disciplines, generations, cultures, institutions, sectors and so on.

Currently we are witnessing an avalanche of interactive methods and new forms of knowledge co-creation involving a wide range of societal actors with different interests, perspectives and values but with similar challenges. Although these differences are viewed as problematic by some, they are seen as crucial by others. Educational psychologists for long have argued and shown that learning requires some form of (internal) conflict or dissonance (Berlyne, 1965; Festinger, 1957; Piaget, 1964). Exposure to alternative ways of seeing, framing and interpreting, can be a powerful way of creating such dissonance. However, for some this may lead to too much dissonance and a defensive response which leads to tighter hold on his or her prior way of seeing things, while for others it might lead to a re-considering of ones views and the adoption or co-creation of a new one. Dissonance can, when introduced carefully, lead to, to borrow a key concept from Marten Scheffer, a tipping point (Scheffer, 2009) in ones thinking. Such tipping points appear necessary in order to generate new thinking that can unfreeze minds and break with existing routines and systems. Dissonance is a key concept of social learning as used in the context of the Chair I am accepting today.

Social learning

Two things need to be stated up front about social learning: it is not a new concept and it has many interpretations. Harold Glasser's opening chapter in the

edited volume 'Social learning towards a sustainable world' (Glasser, 2007) does an excellent job in illustrating both points. The way I have come to understand it and the reason why I find it so appealing in the context of sustainability can be captured by four key features: 1) the value of difference and diversity in energizing people, introducing dissonance and unleashing creativity, 2) the importance of both reflection and reflexivity, 3) the power of social cohesion and social capital in creating change in complex situations loaded with uncertainty, and 4) the power of collaborative action that strengthens the (unique) qualities of each individual. As sustainability and sustainable development are increasingly seen as emerging properties of collaborative learning, the creation of a more sustainable world above all, as I suggested earlier in this address, requires *learning*, and not just any learning, but learning that leads to a new kind of thinking, alternative values and co-created, creative solutions, co-owned by more reflexive citizens, living in a more reflexive and resilient society.

Social learning in the context of sustainable development builds upon several of its predecessors – some of which are still on-going – like action research & community problem-solving (Wals *et al*., 1990; Wals, 1994), grassroots learning, collaborative learning, and experiential learning, but it emphasizes the cultivation and utilization of pluralism. Such pluralism is needed to allow for transformative disruptions to emerge. 'Transformative' here refers to a shift or a switch to a new way of being and seeing (see also: O' Sullivan, 2001), whereas social learning here refers to learning by mirroring ones own ideas, views, values and perspectives with those of others. Again, a key assumption here is that pluralism and heterogeneity offer more promise in finding creative solutions to stubborn issues, than 'singularism' and homogeneity (see also Page, 2007). Put simply: people learn more from each other when they are different from one another then when they are like-minded but only when there is "chemistry" or social cohesion in the group for otherwise the differences between them might just as well become barriers for mutual learning. Although the evidence is still sketchy and more research needs to be done, it appears that the development of social cohesion among a diverse group of students seems conducive to better listening, creating empathy and for 'Gestaltswitching' (Wals and Blewitt, 2010).

Gestalswitching is derived from the German concept of *Gestalt* or 'mind-set' and the related *Gestaltungskompetenz* which some German sustainability educators and researchers use to articulate the kinds of qualities, competencies and attributes learners need to develop when engaging in sustainability issues (Barth *et al.*, 2007). Gestaltswitching then refers to the switching back and forth between different mind-sets. In the context of sustainability there is a multitude of "Gestalts" in play. Figure 8 identifies four of them: the temporal Gestalt (past, present, future and intergenerational mind-sets), the disciplinary Gestalt (a range of social science and natural science mind-sets), the spatial gestalt (local, regional, global and beyond global mind-sets) and the cultural Gestalt (multiple cultural mind-sets whereby culture is broadly understood). Sustainability competence then refers to one's ability to respond to a sustainability challenge with all these Gestalts in mind and to consider the challenge from a range of vantage points. The switching back and forth between different positions requires an awareness of ones own predominant Gestalts and willingness to, at least temporary, put oneself in another Gestalt on all four dimensions represented in figure 8. It can be argued that one Gestalt needs to be added still which might be called the "trans-human" Gestalt which suggests we also need to be able to imagine the world from the perspective on the non or more than human world, allowing more eco-centric and bio-centric mind-sets to enter our thinking and acting as well. Transformative social learning towards sustainability requires the integrative switching back and forth between the various Gestalts, mind-sets or lenses identified here.

An important task of education then is to help learners to appreciate and utilize difference. The development of knowledge and understanding has both personal and shared elements to it. Social interaction allows one to relate or mirror his or her ideas, insights, experiences and feelings to those of others (see also the transcultural dimension in Figure 8). In this process of 'relating to' or 'mirroring' these personal ideas, insights, experiences and feelings are likely to change as a result. The ability to 'mirror' requires empathy or a willingness to open-up to and sympathize with 'otherness' and/or the other. In an increasingly individualizing world people's innate ability for empathy tends to erode, undermining our potential to explore and utilize diversity (de Waal, 2009). This mirroring may prompt the learner to rethink his or her ideas in light of alternative, possibly contesting, viewpoints or

ways of thinking and feeling. At the same time (learning) experiences, which are shared with others, are likely to gain importance. This is not to say that personal experiences, which are kept to oneself, are insignificant. But shared viewpoints or ways of thinking and feeling give the learner a sense of competence and belonging to the community of learners.

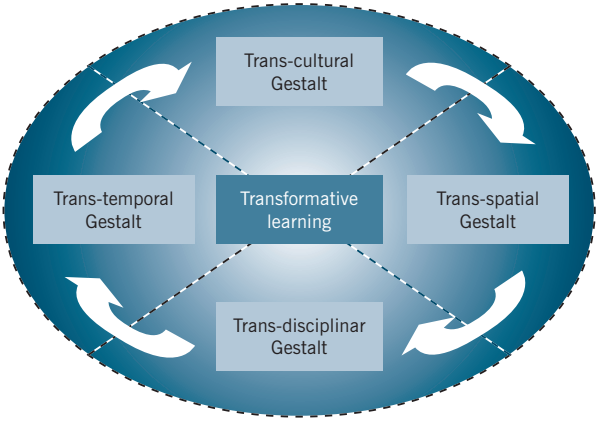


Figure 8. Four key Gestalts in play in transformative learning towards a more sustainable world

Another component of sustainability competence, related to these Gestalts and the ability to switch between them, is the ability to cope with uncertainty. This is a major challenge for higher education as traditionally many scientists consider minimizing uncertainty and maximizing predictability one of their key quests. The emergent uncertainty paradigm however holds that it is an illusion to think that we will ever be able to achieve zero uncertainty or even get close to that. Instead this uncertainty paradigm suggests that more science, information, knowledge might not necessarily lead to less uncertainty, it may actually lead to more as new complexities and questions arise. Instead of putting our academic minds towards minimizing uncertainty and maximizing predictability it might be more fruitful to put our energy towards *living with* uncertainty: seeing it as a given, something that can not be conquered. In light of sustainability this also implies that we need to develop a 'precautionary reflexivity' that can steer us clear of the

inaction, paralysis and apathy that often results from the prevailing 'wait and see' attitude among many citizens, including scientists, which suggests that until we are not sure, and until there is disagreement among scientists and policy-makers about what is happening to the planet, we have no reason to break with our existing routines and can return to business as usual. In their edited volume on education and climate change, Kagawa and Selby write: "*As a fundamental contribution to climate change [prevention and adaptation], it seems that educational spaces should build a culture of learning awash with uncertainty and in which uncertainty provokes transformative yet precautionary commitment rather than paralysis*" (Kagawa and Selby, 2010, p. 243).

Potential research areas

Although the Chair's research agenda is to be co-designed by the members of the proposed the network and UNITWIN partnerships[2], the research challenges listed below appear fruitful for generating such an agenda (Wals 2007; Glasser 2007). They are not listed in any particular order and are not intended to be exhaustive.

Initiate a comprehensive, systematic review of existing applications and case studies of "social learning."

This component has three main purposes: (1) to document the full range of interpretations of social learning across all disciplines; (2) to document the range of existing applications of social learning; and (3) to understand how researchers and practitioners from different disciplines have attempted to funnel uncoordinated and inharmonious individual actions into collective actions that support explicit goals. The current work of our Marie Curie post-doc Romina Rodela will be instrumental in advancing this area of research.

[2] Anticipated partners include: The Environmental Learning Centre of Rhodes University (South Africa), Western Michigan University's Office of Sustainability (USA); the Department of Natural Resources of Cornell University (USA), The National Museums of Kenya (Kenya).

Understand the role conflict, dissonance and diversity (pluralism) in social learning processes.

Although it is generally recognized that the dissonance that results from the interplay between diverging perspectives, values and knowledge systems can be a key trigger for learning, we know little about the idea of situated and personal 'optimal dissonance'. Given the importance of conflict and dissonance in social learning, it is important to be mindful of people's comfort zones or dissonance thresholds. Some people are quite comfortable with dissonance and are challenged and energized by different views, while others have a much lower tolerance with regards to ideas conflicting to their own. The trick is to learn on the edge of peoples' individual comfort zones with regards to dissonance: if the process takes place too far outside of this zone, dissonance will not be constructive and will block learning. However, if the process takes place well within peoples' comfort zones – as is the case when homogenous groups of like-minded people come together – learning is likely to be blocked as well. Ideally facilitators of social learning become skilful in reading peoples' comfort zones, and when needed, expanding them little by little. An important role of facilitators of social learning is to create space for alternative views that lead to the various levels of dissonance needed to trigger learning both at the individual and at the collective level. A better understanding is required of how these processes work and how they can be facilitated. The work of my colleagues PJ Beers and Jifke Sol very much touches upon this area of research.

Identify key characteristics and indicators of sustainability-oriented social learning configurations.

An important question to be asked is what conditions and affordances that are conducive to social learning in the context of sustainability. George Siemens speaks of a 'learning ecology' to emphasize that connectivity between people is influenced and can be strengthened by a number of inter-related factors that together form a learning configuration. He uses the concept of connectivism to refer to the need for the integration of principles explored by chaos, network, and complexity and self-organization theories (Siemens, 2005). Figure 9 shows how a learning ecology is a networked, facilitated and mediated configuration of formal and informal

forms of learning revolving around a change or transformation challenge. The learning taking place is influenced by the filters learners bring to the configurations (values, perspectives and beliefs), the conduits that facilitate learning (language, media and technology), the various dimensions of learning (from learning about something to learning to transform something) and the different layers of learning concepts (from data to wisdom). Although Siemen's work is embedded in a context of web-based and ICT-supported learning without a normative focus on sustainability, his conceptualization of learning and learning environments appears promising here as well. During the coming years we hope to build upon these insights and unveil new ones as we will actively research a number of 'learning configurations in action' at the cross-roads of formal and informal learning. Again the current work of my colleagues PJ Beers and Jifke Sol is relevant here but certainly also the work on integrative learning configurations of PhD student Petra Cremers.

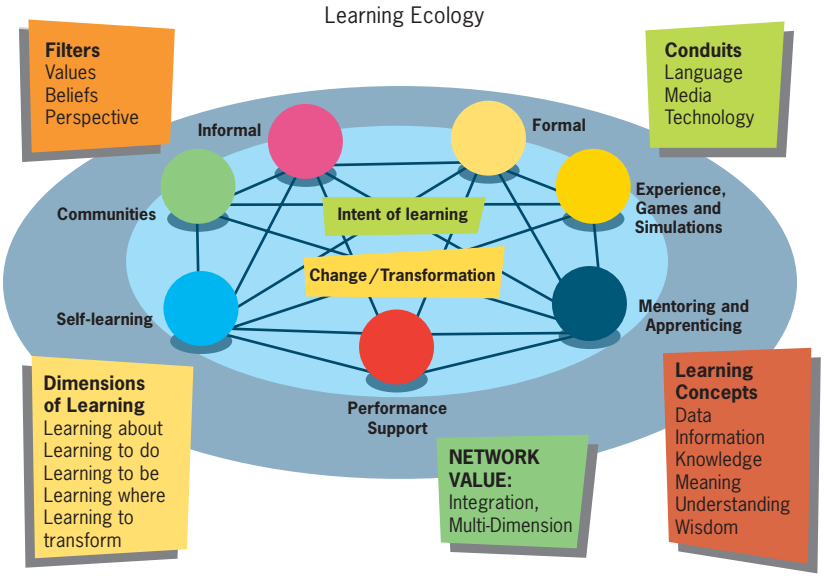


Figure 9. George Siemens' Learning Ecology (Siemens, 2005)

Describe social learning competencies in the context of sustainable development.

Both the participants in social learning and facilitators of social learning will need some basic competencies in order to trigger and support a learning process powerful enough to realize innovations and transitions that require a change of values, a change of (corporate) culture, a change of lifestyle, and, ultimately, a whole system redesign. But what do these competencies look like and how can they be developed? The focus on competence seems inevitable as the Chair I am accepting is located within a research and education group that focuses to a large degree on competence. Currently a number of colleagues within the Education & Competence Studies (ECS) are exploring competence with sustainability as a normative underpinning, including Renate Wesselink, Anouk Brack and Valentina Tassone.

The above research challenges can be taken up in a range of contexts including but the present Chair will centre on sustainability-focused social learning at the cross-roads of informal, non-formal and formal education (primary, secondary, tertiary). Such a context also includes community-based social learning and lifelong learning but always in connection with educational institutions and organizations.

Educational development

Obviously the Chair will also need to contribute to the transformation of education within Wageningen University itself and beyond. I have been fortunate to become a part of a student initiated initiative to develop a minor on sustainability that is based on some of the principles outlined in this inaugural address. A diverse group of students and faculty at Wageningen University with a common interest in transdisciplinarity, innovation and integrative approaches, has been coming together since February of 2009[3]. This group is currently involved in creating a cross-boundary & transformative (BSc Minor) program of a modest 24 credits to address sustainability. The program seeks to support students and,

[3] Students and faculty active in this group include: Wiebe Aans; Irena Ateljevic; PJ Beers; Anouk Brack; Karen Fortuin; Lisa Schwarzin; Maja Slingerland; Valentina Tassone; Alejandra Vargas Foncesca; Arjen Wals and Renate Werkman.

indeed, faculty in learning to walk the talk of sustainability while developing a grounded understanding of the multiple dimensions of sustainability. The group is energetically spiraling towards a promising design of an integrative minor (see Figure 10).

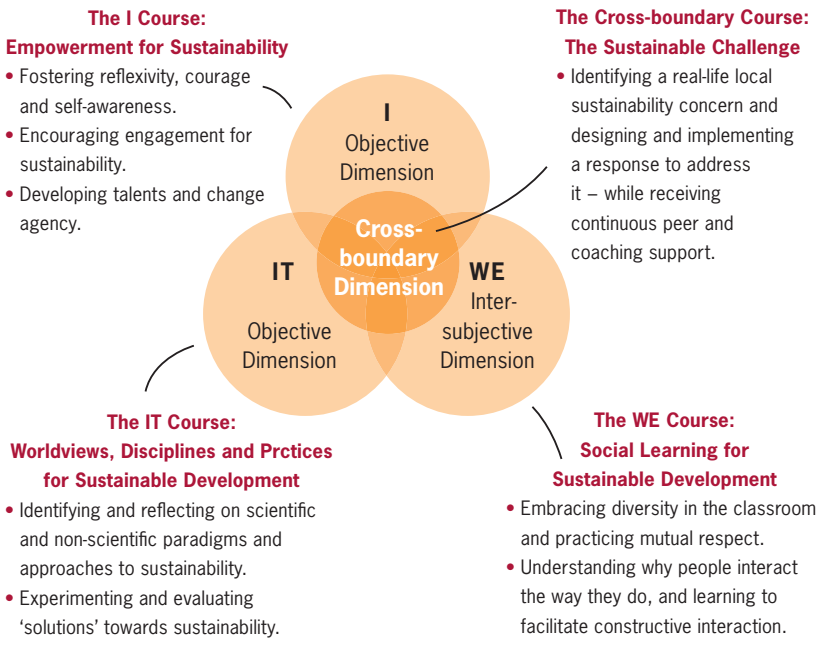


Figure 10. Core components of the sustainability minor proposed at Wageningen University

The minor consists of four courses of six ECTS each, three of which address different dimensions of sustainability while one assures that these dimensions are considered in their relatedness.

Learning within the 'I' dimension' primarily constitutes uncovering values, perspectives and motivation for being a change maker for a more sustainable world. The corresponding 'I' course - Empowerment for Sustainability – focuses on foste-

ring reflexivity, courage and self-awareness, sharing motivation for sustainability, questioning values and attitudes, and developing talents and change agency skills.

Learning within the 'It' dimension centers on the development of a critical and reflexive approach to a broad range of theoretical models and practical techniques for sustainable development. The corresponding 'It' course- Disciplines and Practices for Sustainable Development – focuses on identifying and reflecting on scientific and non-scientific paradigms and approaches to sustainability, experimenting and evaluating 'solutions' towards sustainability, and engaging in a learning environment that stimulates creativity and interaction.

Learning within the 'We' dimension explores the change potential of diversity and conveys design and facilitation principles for collaborative learning processes in the context of sustainable development. The corresponding 'We' course' - Social Learning for Sustainable Development – focuses on embracing diversity in the classroom and practicing mutual respect, understanding why people interact the way they do, and learning to facilitate constructive interaction, and developing communication and collaboration skills.

Learning within the 'Cross-boundary' dimension' provides opportunities for experiencing the inter-connectedness of the 'I', 'We' and 'It' dimensions by engaging in a real-life (sustainability) concern. The corresponding 'Cross-boundary' course - The Sustainability Challenge – focuses on learning in action by identifying a real-life sustainability concern and designing and implementing a response to address it, while receiving continuous peer and stakeholder feedback and coaching support.

The minor will be submitted for approval to the Educational Board of Wageningen University in the Fall of 2010.

The Chair's biotope

The story I have been telling so far hopefully makes clear that integrating sustainability in formal education institutions, including universities, is just as much about *how* we teach, learn and research as it about *what* we teach, learn and research. Up until now universities have become champions in analytical

thinking and in reducing the world in the smaller seemingly measurable units and parts giving, arguably, a false, sense of control and certainty. Sustainability, however, requires a different kind of expertise and demands alternative ways of viewing the world that lean on, among other things, systems thinking, integrative design and multiple ways of knowing. Inevitably this requires new forms of teaching, learning and research and new competencies on the part of teaching staff. But is also requires a reconsideration of what is valued in the academic world. Science for Impact is not the same as Science for Impact Factors. The former requires mechanisms for assessing the role of the university community in advancing sustainability in society, whereas the latter tends to narrowly focus on scientific output in high ranking journals. Science for societal relevance and sustainability cannot be done without reconceptualizing and perhaps even blurring the boundaries between institutional and community-based learning. This will require what might be called the hybridization of knowledge creation: involving multiple stakeholders, multiple ways of knowing and different forms of knowledge, if only to creatively break with routine thinking and stubborn unsustainable systems and practices.

The question of the place of sustainability in the curriculum of higher education and of education in general is not one of integration but rather one of innovation and systemic change within our institutions that will allow for more transformative learning to take place. As suggested earlier in this address, such learning is emphasizes 'learning for being', alongside learning for knowing and learning for doing. It requires permeability between disciplines, university and the wider community, and between cultures, along with the competence to integrate, connect, confront and reconcile multiple ways of looking at the world. At present most of our universities are still leading the way in advancing the kind of thinking, teaching and research that only accelerates un-sustainability. In order to break this pattern we need to question and reform deeply entrenched routines, structures and practices by taking advantage of the privileged position universities have in our society and utilizing some of the brightest minds on the planet in finding ways to preserve, rather than to destroy, that very same planet.

Education and Competence Studies

The Chair which I am formally accepting today is located within the Education & Competence Studies (ECS) group of Wageningen University (WU). At ECS and its predecessors we have gained a number of useful insights in the kinds of learning processes that appear promising in actively engaging people in existential issues. First, from the mid-nineteen eighties onwards, together with colleagues like Art Alblas and Marjan Margadant and a number of dedicated graduate students, many of whom are now active in the field of EE, with a focus on young people and nature and environment in the context of formal education (primary, secondary and vocational). A number of well-known publications were published that focused on sound pedagogical and didactical approaches to EE. Admittedly we lost a few years in the late nineties when the university initially decided to eliminate the Education Group, only to overturn that decision shortly there-after. During those turbulent years, people like Alblas and Margadant left the university to move to Utrecht University, while I myself decided to join the Communication and Innovation Studies Group where I was given the opportunity to keep EE alive within the WU. While there I greatly benefitted from the thinking of people like Niels Röling, Fanny Heijman, Noëlle Aarts, Cees Leeuwis and Cees van Woerkum.

Under the leadership of the Martin Mulder, the newly appointed Head of the dressed-down Education Group, the Chair group made an impressive come back under the name of Education and Competence Studies. Mulder and those who remained, those who were eventually hired anew and those who came back under much improved conditions, including myself, but also Associate Professor Harm Biemans, were able to re-align the Group in a way that fits the life-science and sustainability profile of WU rather well. ECS today, not only focuses on teaching academic skills and teaching students how to teach, but continues to develop educational niches that are unique for Wageningen, and to a degree, the Netherlands as a whole. These niches include: development education, human resource management and development in life-science related businesses and industries, competence-based education in green vocational education and higher education and, last but not least, environmental education and education and learning in the context of sustainability.

The latter niche indeed is unique in The Netherlands, especially now that Utrecht University decided to withdraw its support to its EE-programme as a part of severe budget cuts in the faculty of Biological Sciences which, until recently, hosted the Endowed Chair in Environmental Education. This Chair which was held by Kris van Koppen who, thankfully I may add, again is employed fulltime by the Environmental Policy Group of WU and who remains committed to supporting the field of EE.

The WUR Community

There are many WUR-groups, other than ECS, who have developed expertise in social learning as well. There is great diversity within Wageningen UR itself that remains largely untapped. A key challenge in years to come will be to take full advantage of these differences in designing a joint research and education agenda that can help societies transition towards a more sustainable world. Many groups within WUR are using concepts like learning and transitions to describe the processes that appear necessary to break with present unsustainable routines and systems. They do so at different levels, e.g. the individual level (learning individual, personal development), the organizational level (learning organization, organizational development), the community level (community-based learning, community development), the societal level (learning society, regional/national development), and in a range of contexts, e.g. governance, innovation, entrepreneurship, education, in all the Wageningen domains. Social learning increasingly appears in a range of sustainability-related fields that pre-occupy a number of Chair Groups and research units. These fields include, but are not limited to:

- organizational learning and environmental management within a framework of corporate social responsibility and 'the greening' of business and industry,
- interactive policymaking and multi-stakeholder governance,
- multiple land-use and integrated (regional) rural development,
- reflexive design, transition management and systems innovation,
- disaster studies, community building and the cultivation of resilience.

This new Chair provides an opportunity to link some of these fields and the people and groups involved. The 'crossing boundaries' seminar[4] which, like this inaugural lecture, can be seen as a launch for the Chair, has already created such linkages. The newly proposed minor on sustainability and the new course on 'Social learning and sustainable development' will bring together some of these chair groups and people. In the minor, described earlier, the students and faculty will jointly develop a better understanding of the connections between diversity, interaction, social learning and deep sustainability by actively exploring, critiquing and suggesting interventions to change using real-world examples of communities from around the world working together towards sustainability. I hope some of the outcomes of the lessons learnt in the minor and related courses but also from the execution of the proposed research agenda will inform Wageningen University's own on-going attempts to become more sustainable.

At the same time it is my intention to link up with other research groups in The Netherlands that over time have developed expertise in social learning in the context of sustainability (e.g. DRIFT, ATHENA and ICIS).

Pedagogy of hope

The cover of the invitation to this inaugural lecture and of the printed version is not exactly one that radiates optimism and hope. On the contrary it breathes despair. It is not my intention for the listener or the reader to come away from this address thinking 'we are on a collision course and there's not much we can do about it'. Around the world there are many examples of innovations, transitions and 'next practices' that do not have a narrow single normative underpinning of (rapid) economic growth, but a broader inclusive agenda of sustainability. Granted, many

[4] "Crossing Boundaries and Expanding Horizons: Rethinking education and learning in an era of (un) sustainability" was an International seminar organized by the two Dutch UNESCO ESD Chairs (Professor Rietje van Dam-Mieras and Professor Arjen Wals) in May 26-28th, 2010 in both The Hague and Wageningen, The Netherlands. The conference was supported by The Dutch Learning for Sustainable Development Program via Agentschap.nl

of these are still at the margins and we often fail to find ways to make them mainstream. In part this is because they cannot be supplanted, transferred or handed-over with a 'how to' manual. Instead they require a deeper learning process that is grounded in the everyday reality of people, organizations, institutions, businesses and communities. But these examples and 'next practices'[5] and their careful analysis can be extremely helpful, not only as a source of inspiration and 'yes we can!' feelings but also, and equally important, as stepping stones for improving models, methods, heuristics and other tools. Such tools can help the quality of the learning taking place and its associated sustainability practices. For, as Paulo Freire articulated so well, hope must be rooted in practice, in the struggle. If not, if there is inaction, you get hopelessness and despair (Freire, 1992). Freire described hope as an ontological need that should be *anchored in practice* in order to become *historical concreteness*. Without hope, we are hopeless and cannot begin the struggle to change (Ibid.). Another sign of hope comes from a very different corner. Ethological primatologist de Waal, who has studied apes and monkeys for over 30 years concludes in his important book 'The age of empathy' (de Waal, 2009) that greed and aggression are complemented and usually overmastered by cooperation, justice, and peacemaking in social species.

Word of thanks

There are many people who have somehow helped and/or inspired me to arrive at this point in this on-going journey. In my professional life I can recognize many people who have influenced the directions I have taken in the last 25 years or so but I will limit myself to two. One who helped paved the way during my early years at Wageningen University: Art Alblas. Art made it possible for me to do a thesis in Environmental Education in a time that the field barely existed at this university. Not only that, he made it into his own area of expertise and successfully launched the field of EE as a legitimate field of education and research in Wageningen. Someone else, who has been pivotal for me, especially during my PhD-years at the University of Michigan, is the late Bill Stapp of the University of Michigan to whom I already referred earlier. In addition there have been a number of communi-

[5] A 'next practice' refers to exemplary niche practices that hold promise for current mainstream practices and can act as beacons and / or inspiration for future transitions.

ties or networks that over the years have shaped who I am today: the Caretakers of the Environment network of secondary school teachers and students, now closing in on its 25th anniversary, the international group of researchers affiliated with the North American Association of Environmental Education and the Special Interest Group on Environmental Education of American Educational Research Association.

A little closer to home I wish to recognize the group of which I am a part and which is the host of my Chair: Education & Competence Studies. Although there is still a lot of potential for social learning within our own group that remains untapped, it is clear that ECS has a powerful mix of talented people working on topical issues in education, competence development and learning. Much credit goes to ECS-Chair Martin Mulder who is largely responsible for creating this mix and providing people with the space and autonomy they need to excel. In the Dutch policy-scene two people have been particularly important to me and many others in the field of Environmental Education in The Netherlands: Dirk Huitzing and Roel van Raaij. Without them the development of EE and ESD in The Netherlands would in all likelihood have stagnated somewhere in the mid-nineties of the last century.

Of course much credit goes to my family as their influence on me goes much further back in time and in inevitably is much deeper. Would I be standing here today if it were not for my parents taking me, my two sisters and brother camping every summer, or on frequent walks in the woods and dunes or to the farm house in Ratum in the East of Holland? Would I be standing here if it were not for my mother always showing interest in my work and always encouraging me to carry on? Would I be standing here today if it were not for my ever-supporting and loving wife, Anne who grew up on pristine Beaverlake in Hartland, Wisconsin and who had the courage to become an exchange student in The Netherlands in 1979? Would I be standing here today if it were not for our two adorable children, Brian and Kendra fueling the ever growing desire in me and Anne to leave a world behind that is still livable, enjoyable and, indeed, sustainable, for them and for their children?

Finally, like I did with the book on social learning I edited a few years ago, which I think contributed greatly to the creation of this endowed professorship and UNESCO Chair, I am dedicating this Chair to my father Harry Wals who died suddenly in 2006 at the age of 70. My father was in many ways a leading environmental educator in this country and, indeed, far beyond. His love for people and nature inspired not only me but all those he touched around the world. With his charisma, energy, and youth, he was, without ever using the term himself, a catalyst of social learning. Boy, would he have loved to be here today with all of us, sitting there next to my mother. Knowing that he's looking over my shoulder right now gives me tremendous comfort.

Ik heb gezegd.



Figure 11. Harry Wals in his forties leading a group of biology teachers and environmental educators during a BWO-camp (photo by Kees Both)

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Although technological advances, new policies, laws and legislation are essential in moving towards sustainability, it is not enough. Ultimately, sustainability needs to emerge in the everyday fabric of life - in the minds of people, organizations and communities, and in the values they live by. Such emergence depends on how and what people learn, both individually and collectively. A central question in my work is how to create conditions that support new forms of learning that take full advantage of the diversity, creativity and resourcefulness which is all around us, but so far remains largely untapped in our search for a world that is more sustainable than the one currently in prospect.

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